

The Times and Register.

Vol. XXVI. No. 12.

PHILADELPHIA, MARCH 25, 1893.

Whole No. 759.

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Original Articles.

DIPHTHERIA.

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DIPHTHERIA may be defined as a specific contagious disease, characterized by pronounced constitutional symptoms and inflammation of the mucous membrane of the fauces and upper air passages, with exudation of inflammatory lymph, which rapidly becomes formed into false membrane.

It has long been recognized as one of the zymotic fevers. Many English authors, with whom I am fully in accord, consider it a constitutional disease with local manifestations, but among continental physicians and American writers there are many who regard it as a primary local affection with secondary constitutional symptoms. I can see no more reason for regarding this as a local disease than for regarding vaccinia in the same light. To me the peculiar false membrane formed in the fauces appears analogous to the peculiar vesicle developed after inoculation with vaccine virus, and the fact that there is a distinct period of incubation extending sometimes over many days before there is any development in the fauces, together with the fact that in some instances the disease runs to a fatal termination within a few hours and before there has been any appreciable local

manifestation, seems to prove this position.

ETIOLOGY.—The disease is undoubtedly contagious, but the degree of contagiousness varies much in different epidemics. The affection is generally believed to be due to a specific micro-organism, the identity of which is not as yet fully established. Various bacteria have been found in the mouth of those suffering from diphtheria, most of which, however, may also be found in the buccal secretions from healthy individuals. Most bacteriologists now attribute it to the Klebs-Loeffler bacillus. This bacterium is a microscopic rod about the length of the tubercular bacillus, but twice its thickness. It is usually more or less bent, with rounded extremities, one or both of which may be thickened, giving the club or dumb-bell appearance. It is immobile and contains no spores. It does not readily absorb the common aniline stains, but may be colored by the solution of Loeffler's methylene blue, the coloration often being most intense at the extremities. These bacilli are said to be found most abundantly in the superficial portions of the false membrane, and nearly all experiments go to prove that they do not often enter the lymphatics or blood vessels; therefore, of itself, the bacillus is apparently innocuous, but it secretes a virulent toxalbumin or ptomaine easily absorbed, which produces the constitutional symptoms of the disease. Numerous experiments have demonstrated that pseudo-membranous inflammation is often produced independ-

ently of this bacillus, as, for example, that resulting from surgical injuries to the throat, or various chemical caustics; and they have also shown that certain exudative inflammations supposed to be of microbic origin, as, for example, those frequently observed in scarlet fever and measles, are not attended by the development of the Klebs-Loeffler bacillus. These latter inflammations have been termed pseudo-diphtheria, and it is stated that they can only be distinguished from true diphtheria by the absence of the Klebs-Loeffler bacillus, by not being followed by paralysis, and by not being attended by a peculiar form of albuminuria, which occurs in true diphtheria independently of dropsy or uremic poisoning. The necessity for assuming that there are two varieties of diphtheria, seems to me to justify the statement made in the beginning, that the identity of the micro-organism which is supposed to cause the disease is as yet uncertain.

The most frequently predisposing cause of diphtheria is exposure to cold, more particularly in the spring and fall months, when the temperature of houses is liable to be kept at from 65° to 68° F.

At this time adults moving about the house do not realize the necessity for fire, but the little children upon the floor are exposed to a temperature from four to eight degrees lower; or morning and evening children are allowed to run about in their night clothing and thus contract colds, which favor the development of diphtheria.

The symptoms of this disease are so well known that I will call attention only to the peculiarity of the temperature, which is often overlooked, and to the albumen in the urine. The temperature at first seldom rises above 101° or 102° F., and on the appearance of false membrane it usually falls and may even become subnormal. During the third or fourth day of the attack it is likely to rise again to 102° or 103° F., indicating in favorable cases suppuration and exfoliation of the false membrane; or in those which are progressing unfavorably, extension of the disease to the larynx, the lower air passages, or to the intestinal canal. A sudden fall of temperature after four or five days is a symptom of grave

import. Albuminuria is present in nearly all cases very early in the disease.

DIAGNOSIS — Diphtheria is not likely to be mistaken by the experienced physician for any disease except follicular tonsillitis and simple membranous sore throat; though in some cases, it may be a difficult matter to distinguish between diphtheria and the pseudo-membranous forms of scarlatina or measles. The essential points of difference between diphtheria and follicular tonsillitis are: In follicular tonsillitis there is higher temperature, commonly two or three degrees more than that of diphtheria; there is much more pain in the throat, and difficulty of opening the mouth, which is not usually present in diphtheria; the swelling of the tonsils is greater, and there appears a number of small yellow spots where secretions have collected in the follicles instead of one or two uniform patches of false membrane spreading over a considerable part of the throat.

In simple membranous sore throat, at first there are numerous herpetic vesicles, but after two or three days these are covered with a membrane similar to that of diphtheria, though it is not so thick and more easily removed. Commonly also, there are several patches of this false membrane, and herpes labialis is apt to occur at the same time. The pain in simple membranous, or, as it is sometimes known, herpetic sore throat, is usually very much more intense than in diphtheria.

There is usually no difficulty in distinguishing between diphtheria and scarlatina or measles, but sometimes in either of these affections the deposit of false membrane in the fauces may cause an appearance very like that of diphtheria. There is a question whether in such cases there are the two diseases combined, or whether the pseudo-membrane, as claimed by bacteriologists, is entirely different in its origin from true diphtheritic membrane. The distinctive features between diphtheria and the cases of scarlatina in which the throat symptoms closely simulate it are: The higher and more persistent fever in scarlatina, the greater pain; more intense congestion, and its wider diffusion; the redness of the tongue and usually a thinner and less extensive false membrane, and finally the typical rash.

PROGNOSIS.—The prognosis of diphtheria is always grave and we can never assure the friends that the patient is out of danger until he has been well for three or four weeks. I have known cases to terminate fatally within twelve hours after the beginning of the attack, but in the majority of fatal cases death does not occur before the fourth or fifth day, and in a considerable number life may continue five or six weeks. In some epidemics of the disease a larger percentage of patients recover; but in others twenty-five or thirty, or even a larger per cent., prove fatal. The deposit of false membrane in the nose, or naso-pharynx, or intestines; the occurrence of extreme pain in the ears and throat, of purpuric spots on the skin, or of epistaxis or other hemorrhages, and the presence of persistent anorexia, vomiting, diarrhoea or suppression of urine, are all grave indications. Death usually results from ashenia, suffocation, heart failure or convulsions. Not infrequently paralytic symptoms supervene three or four weeks after the beginning of the attack, but except in cases where the respiratory or circulatory centers are involved, this is usually recovered from, though it may not be for weeks or even months. Sometimes more or less loss of muscular mobility remains permanently.

TREATMENT.—There are few diseases in which more numerous methods of treatment have been highly recommended, a fact which may be explained by the inutility of the majority of the means adopted. So much depends upon the condition of the patient when attacked, upon his hygienic surroundings and the variety and nature of the particular epidemic, that physicians are necessarily led astray in estimating the effect of remedies employed. During the first part of a severe epidemic a large percentage of patients may die, whatever methods are used in the treatment; but later on the cases become less and less severe and the fatality greatly diminishes, regardless of the treatment employed. However, the remedies which are in use during the latter part of the epidemics are liable to receive all the credit.

Whenever diphtheria appears in a household, the patient should be isolated at once, and all other children should be

removed if practicable, and those in attendance upon the patient should not come in contact with other members of the family. When a good room can be had in the upper story, if these precautions are observed, there is very slight danger of the contagion extending. The rooms occupied by the patient should be kept carefully closed and the doors covered with sheets constantly moistened by antiseptics. The sick room should be kept warm and thoroughly ventilated; and finally when the attack subsides, the utensils and clothing used in the sick room should be disinfected or destroyed, and the room thoroughly fumigated and aired before it is used again; even then children ought not to occupy the room for several weeks afterwards.

In the beginning of the attack, ice taken into the mouth often tends to relieve thirst, reduce congestion, and apparently to limit the progress of the disease. More effective has seemed to me the application externally of ice bags or the coil of metallic or rubber tubing through which a current of ice-water is constantly pouring. A proper ice bag should be three or four inches wide and twelve to sixteen inches long. It should be half filled with pieces of ice about the size of filberts. The bag should be folded in a handkerchief, or other thin cloth, and tied under the chin so that it will extend up to the ears on both sides. The ice will need to be renewed about every hour. Usually this is grateful to the sufferer, but occasionally patients complain of pain when cold is employed and, in these, very hot applications will be found to answer a better purpose, but whether heat or cold be used, it must be continuous; otherwise more harm than good will result.

As soon as the membrane begins to separate, which is apt to take place on the third or fourth day, hot applications appear to be more useful than cold. Liquid diet in the form of beef tea, broth, or better yet, milk, should be given at regular intervals and in large quantities. Half a pint of milk or its equivalent should be given, if the stomach will bear it, as often as every third hour for a child ten years of age. Alcoholic stimulants are recommended early by many practitioners, but to me they seem un-

necessary and undesirable until the pulse shows some depression. On the principle that bacteria cannot live in acid solutions, the free use of acidulated drinks or gargles is recommended, and this possibly explains the reputation attained among the laity by pine-apple juice as a cure for diphtheria. Many substances have been used with the hope of removing the false membrane; the simplest of these is steam, which may be impregnated with the time-honored lime-water and applied by the croup tent or any suitable atomizer, but it is extremely doubtful whether lime in any form is ever applied in sufficient quantity to appreciably affect the pseudo-membrane.

Lactic acid is one of the most powerful solvents for pseudo-membrane. It has been highly recommended in about fifteen per cent. solution, to be frequently employed as a gargle or spray, and in full strength, to be carefully applied by the physician twice daily to the false membrane.

Trypsin, resorcin and papain have all been used for their solvent effects upon the membrane, but they seem to have little if any influence upon the progress of the disease. Tannic acid and alum are used to astringe to the false membrane and insufflations of sulphur have become extremely popular with the laity—but none of these seem to have much effect upon the disease.

Solutions of mercury bichloride, one to one thousand or weaker; of carbolic acid, one to three per cent.; of potassium permanganate, one per cent.; liquor sodæ chlorinatæ, five per cent.; of chloral, about thirty per cent.; or of sulphurous acid, from five to ten per cent., and iodide of sulphur ʒij to glycerine ʒi , have all been highly recommended, from time to time, as gargles, sprays or pigments to destroy the poisonous germs in the throat. Peroxide of hydrogen is also used for the same purpose, either diluted with an equal part of water, or in full strength as obtained from the pharmacist. Tincture of myrrh, strong alcohol, and tincture of the chloride of iron have also been extolled, and occasionally tincture of iodine or a strong solution of nitrate of silver has been used. While any of these may, if properly used, prove efficacious, I be-

lieve that strong applications often do more harm than good, and any remedy which causes the patient pain for more than five minutes is likely to be injurious.

Recently I have adopted as a local application, either by means of spray or gargle, a saturated solution of boric acid in cinnamon water, to which I sometimes add one per cent. of carbolic acid. The researches of Roux and Yersin, in 1889, demonstrated that the toxicity of cultures of the diphtheritic bacillus is greatly diminished by the addition of carbolic acid, borax or boric acid, and the experiments of Dr. G. V. Black, of Jacksonville, Ill., reported in the *Dental Review*, for February and March, 1889, have shown that the oil of cinnamon, one to 2000 is a most efficient germicide; therefore, a combination of these appears especially suited to the destruction of the diphtheritic bacillus. This application is neither unpleasant, painful, nor dangerous, and from my clinical observation it appears very effective. Internally no remedy has seemed to me so effectual in combating this disease as the long used tincture of iron, in large doses (about one minim for each year of the child's age) combined with an equal quantity of glycerine and enough syrup of tolu to make one drachm. This dose is administered every hour in serious cases, or once in two hours where the symptoms are less severe. The patient is first given three or four swallows of water, so that the medicine will not prove irritating to the stomach, then the iron is administered in as concentrated a form as can be taken without causing pain; the patient is directed to hold it in the throat as long as possible, thus obtaining the effect of a gargle, and then it is swallowed. Usually as much as ten minims to the drachm will not cause pain in the early stages of the disease, but later on it may be necessary to dilute the dose with water. The gargle or spray should also be used every hour when it can be done without a contest. Thus, one or the other would be administered every half hour except during the night, when it is often necessary to allow the patient to sleep. When the disease is progressing it is sometimes unsafe to allow the patient to go more than half an hour without receiving either the gargle or the solution of

iron; but I would strongly deprecate wakening the patient more often than is necessary for this purpose, and as soon as the membrane ceases to spread, I would allow the child to sleep one or two hours rather than disturb it to give the medicine. Quinine in moderately large doses may be given judiciously. As the stage of depression comes on, alcoholics should be used freely, in the form of wine, whiskey, brandy, or diluted alcohol, whichever is pleasantest to the patient. Children will often take readily equal parts of alcohol and syrup of tolu, which is practically of the same strength as good whiskey, and may be diluted as seems best. When the heart fails, no remedy is of so much value as some of the preparations of *nux vomica*. The tincture, although liable to variation in strength, has seemed to me to act more favorably than strychnine. Whichever preparation is adopted, it must be given in large and frequently repeated doses; to a child, about half a minim of tincture of *nux vomica* for each year of its age may be given every one, two, or three hours, according to the extent of the depression, until the constitutional effects as indicated by twitching of the tendons, are developed; the doses should then be slightly diminished, or the intervals between them prolonged. Within the past few years the bichloride, and other preparations of mercury, have been largely used in the treatment of diphtheria in doses often much larger than could safely be administered to adults. I have myself used freely the mild chloride of mercury with most happy results, especially in diphtheritic laryngitis, but I do not favor large doses of the other preparations, believing that a system already struggling against the virulent poison of diphtheria, is poorly fitted to withstand poisonous doses of bichloride of mercury and its congeners. I have found calomel most efficacious in diphtheritic laryngitis, and have never known it to do harm even when given in very large doses.

Among other remedies which have received the sanction of good authority for this disease are cubebs, copaiba, potassium chlorate, the sulpho-carbolates and sulphites of sodium and potassium, and the salicylates and the benzoates of potassium, sodium and ammonium. In-

deed, there are few remedies of any potency in any disease which have not been tried for this affection and which have not, for a time at least, received much unmerited praise.

When the disease extends to the larynx, non-depressing emetics are sometimes useful to dislodge the false membrane and the mild chloride of mercury in large and frequently repeated doses has appeared beneficial in preventing its deposit. I give calomel in such cases in doses equivalent to half a grain for each year of the child's age, every one or two hours, according to the severity of the case, until its effects upon the bowels are noticeable. It is surprising how much of the remedy may be taken under such circumstances before its characteristic effect upon the stools occur. I have seen a child two or three years of age take thirty or forty grains before the bowels moved. As soon as the effects of the remedy are noticed upon the stools, the dose should be diminished in size and frequency, and when the dyspnoea is relieved, it may be discontinued. Unfortunately, whatever remedies are employed, the false membrane will frequently extend to the glottis, as indicated by difficulty of breathing, blueness of the lips and finger nails, and recession of the soft portions of the chest wall during inspiration; when these symptoms occur, no time should be lost in adopting operative measures, even though a limited number of cases could be cured by mercurials and a small percentage might recover by the unaided efforts of nature.

It is not safe to wait for nature, or the slow effect of medicine in this condition, for statistics have shown that about ninety-five per cent. will die if the larynx becomes involved, unless operative measures are adopted, and even then thirty or thirty-five per cent. can be saved; but many cases that would have soon proved fatal will be saved by early operations than if relief is delayed until pulmonary oedema has occurred in consequence of the laryngeal obstruction. One of two operations may be adopted, that to be preferred depending somewhat upon the age of the child and its surroundings. Other things being equal, in a child under five years of age, I decidedly prefer intubation by O'Dwyer's method, though

in older children it is not quite as satisfactory as tracheotomy. Even in quite large children intubation has been found useful, particularly when the graver operation will not be permitted. I would therefore recommend that it be tried first in all cases, because of the ease and rapidity with which it can be performed, the avoidance of a wound liable to a secondary infection and the ready consent of parents, and finally, because it is no bar to the subsequent performance of tracheotomy, should this severe operation appear necessary. Almost any physician can successfully introduce the O'Dwyer tubes, and the confidence gained by two or three intubations will cause him to recommend the operation earlier, and thus protracted dyspnoea and the consequent pulmonary congestion and œdema will be prevented and many lives will be saved that would be lost if the operation were delayed until suffocation became imminent.

There is only one accident which is likely to occur in the performance of intubation, namely, the crowding downward of loose membrane before the tube. In a few instances this has caused speedy death, but usually when this accident occurs all that is necessary is to at once withdraw the tube, when the loosened membrane will be drawn out with it or will be coughed out immediately afterwards. After intubation the child should be fed with its head considerably lower than the body to prevent fluid from running into the trachea.

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THE CAUSE AND PREVENTION OF DIPHTHERIA.*

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THE cause of diphtheria is a problem, the solution of which has engaged the attention of scientific men in all parts of the world, and while it cannot now be asserted that our knowledge of the subject is complete, yet enough has been ascertained to enable us to formulate

certain rational plans of treatment, and to guide us in our efforts to prevent the dissemination of this dread disease.

The demonstration, by Pasteur, that morbid processes in the animal body were due to the presence of micro-organisms, pointed out the line of investigation that would possibly reveal the cause of diphtheria. And therefore, as a result of patient effort, Klebs in 1883, and Loeffler in 1884, isolated a bacillus that now is recognized as the agent concerned in the production of the train of symptoms and phenomena known as true diphtheria.

While it is agreed that the Klebs-Loeffler bacillus is the cause of diphtheria, yet we must not fail to note that fatal pseudo-membraneous inflammations of the tonsils, pharynx and larynx occur in which the Klebs-Loeffler bacillus is absent, and instead is found a streptococcus, which appears to be identical with the streptococcus pyogenes. Although this variety of pseudo-membraneous inflammation may be uncomplicated, yet it is frequently found associated with scarlet fever or measles.

Recently, Professor Prudden and Dr. W. H. Park, of New York, have published the results of their investigations of the agents concerned in the production of true and false diphtheria. Prudden made bacteriological examinations in twenty-four fatal cases of pseudo-membraneous inflammations of the tonsils, pharynx and larynx, and in all of them the Klebs-Loeffler bacillus was absent; in all but two cases streptococci were found. Park has reported 159 cases of pseudo-membraneous inflammations, and of this number in fifty-four only were the Klebs-Loeffler bacillus found. In the other 105 cases streptococci were present in abundance. Martin, of Paris, in examination of two hundred children supposed to have diphtheria, found the Klebs-Loeffler bacillus absent in seventy-two; and of this class twenty-nine were croup cases. Various investigators, as Boginsky, Kolisko, Sevestre, Wurz, Bourges, and others have found streptococci without the Klebs-Loeffler bacillus in pseudo-membraneous inflammations occurring in scarlet fever.

From this we learn that not every case presenting the gross appearances of diph-

*Read before the New Jersey Sanitary Association, at the meeting held at Lakewood, N. J., December 9th, and 10th, 1892.

theria is really true diphtheria in the sense that the causative agent is the Klebs-Loeffler bacillus. But in view of the fact that the other varieties of pseudo-membranous inflammations, due to the presence of streptococci, are infectious and fatal, even when unassociated with scarlet fever, the lesson to the doctor is that his duty to the patient and the family is just as grave as it would be if the bacillus of Klebs-Loeffler were present. Clinically, no distinction should be made so far as precautionary measures are concerned; scientifically, efforts should always be made to differentiate, and this can only be done with the microscope and culture media.

Granted that the important part assigned to the Klebs-Loeffler bacillus in the etiology of true diphtheria is warranted by the results of the latest investigations, and there are but few who do not admit this, we are not thereby informed as to the laws governing its propagation and growth. Many of us know from observation that the life of the bacillus may be prolonged for many months and finally demonstrate its activity by causing the disease to develop in those brought in contact with the infected locality. Instances have been given where the contagion of diphtheria has been conveyed in clothing, in sewers, in water, and in milk; agar-tube cultures after seven months growth are still alive; bits of membrane no larger than a pin point, kept in cloth, give evidence of activity after six months. These facts indicate that the germ of diphtheria is tenacious of life, and perpetuates its species under varying conditions of soil and environment; yet they do not inform us as to the circumstances dominating its development.

If we believe that the cause of diphtheria is a definite variety of living germ, with characteristics and a life history unlike any other living entity, then we must assume that there are certain positive conditions necessary for its growth and continued existence, as is the case with all other living things in nature.

To claim that its presence in a given locality is accidental, or that, because of unsanitary environment, by a process of rapid evolution a harmless germ was transformed into one with pathogenic

attributes; or, that by a special creative act it is caused to be where it did not exist before, are untenable theories.

No culture experiments have ever resulted in the development of a new type of disease germ; and we have no basis for the idea that nature is engaged in the special work of rapidly creating or evolving these minute agents of destruction, contrary to her methodical processes as observed in the higher orders of animal or vegetable life.

We are constrained to believe that there are certain laws governing the origin and perpetuation of the bacillus diphtheria, but what they are cannot now be definitely formulated. But we *do* know that filthy or unsanitary conditions are co-existent with outbreaks of diphtheria, and there can be no doubt but that moisture, ordinary temperature, and absence of sunlight and pure air are important factors in developing endemics and epidemics of this disease. Further than this, we enter into the domain of doubt and conjecture.

Some observers have thought they traced outbreaks of diphtheria to the spreading of human or animal manure upon land in the vicinity of human habitations. Others attribute its prevalence in cities to the frequent tearing up of the streets, for paving, or trenching for various purposes. Some consider the prevalence of continued dry weather an important factor in developing the disease. Still others, think it is due to drouth alternating with excessive rain. It is supposed that variations of barometric pressure of the atmosphere, over foul and moist soils, causing "ground respiration" and possible liberation of pathogenic germs, may be one of the causes. But it is probable that the theories mentioned above represent coincidental conditions only; and they certainly do not enable us to determine why there should be a rapid proliferation of the germs at one time, under what seems to be conditions identical with those that obtain at another time, when diphtheria does not prevail.

Diphtheria is known to be contagious and infectious, and its prevalence in communities, after the appearance of one or two cases, is largely due to this fact. It is a matter of daily observation that if a

member of a family takes the disease other cases occur in the household. Children sent from an infected house, as a precautionary measure, may convey the affection to those who have not previously been exposed to contagion. The disease may be spread by the dried membrane or expectoration upon pillow-cases, sheets and articles of clothing. Investigation will demonstrate that a large proportion of those having the disease have been in contact with infected individuals or localities; and localities may be centres of infection for a year or more, if not radically disinfected. As bearing upon this point, I have knowledge of a house that was vacated the day following the funeral of a child dead of diphtheria, and it remained unoccupied for one year. It was then taken by a family consisting of parents and one child. In three weeks thereafter the child died of diphtheria. In the absence of any history of exposure to contagion elsewhere, we are forced to the conclusion that the second case in that house was the direct sequel of the first.

In my opinion the most potent agents in causing the spread of diphtheria in communities are the schools—public, private and Sabbath schools. When we consider that it has been proven that the bacillus of this disease has been found in the mouth of patients some days *after* the apparent recovery of the throat lesion, we cannot avoid the conviction that it must also be in the mouth of the destined victim for a variable period before their presence is manifest by the usual symptoms denoting invasion. Therefore, that individual is a menace to her or his companions even during this period of apparent immunity. In many other instances the children are really victims of diphtheria while yet in daily attendance at school. In some of these cases, no doubt, the child, being anxious to continue its studies, does not feel ill enough to ask to remain at home. In others, where the little one speaks of feeling ill, the parents may not think it necessary to keep her from school, as it is not an unheard-of occurrence for some parents to reason that a complaining child must necessarily be a malingerer. In still other instances, the disease may be well advanced before the individual's attention is called to her

condition by symptoms of pain and fever.

In any of these conditions the patient is a source of danger to her companions, and her presence at school may result in their infection and death.

I have recently had under my care a family in which five cases of diphtheria occurred. Two years ago an elderly lady died in that house with diphtheria. A few months subsequent to her death the premises were vacated, and the present occupants moved in. This family of six small children lived there for eighteen months without illness, until two years had elapsed since the death above noted, when diphtheria developed simultaneously in four of the children. Naturally, the first impression would be that here was an instance where diphtheria germs had remained inactive for two years; but finally conditions favorable to their renewed vitality had developed, and as a result a severe local outbreak occurred. But I really did not believe that was the solution of the problem, and upon questioning the mother closely, I ascertained that another child had remained from school a day or two, because it did not feel well, and this child occupied a seat adjoining a scholar who had a few days previously been taken ill with diphtheria. Here was the explanation of the outbreak in that household. A child with an attack so mild that the true nature of the illness was not recognized by the family, and which, it was thought, did not require the doctor's attention, infected four other members and caused one death.

This is but one instance in a great many where I have endeavored to trace a case of diphtheria to its source, and have been led to the school house.

The milk supply is frequently the means of disseminating the bacillus of diphtheria, and as one of the causes of the spread of this disease it is worthy of serious attention. It is really a culture media for the germs, and is peculiarly susceptible to contamination. Within a few months past an outbreak of diphtheria in the town of Melrose, Massachusetts, has been traced to the dairy of a man in whose family several cases of the disease occurred.

While it is not definitely known that

prominent outbreaks of diphtheria are due to contaminated water, yet it is reasonable to suppose that in some instances this is the case. It is known that colonies of the bacillus will survive for months or years in favorable situations, and it is not improbable that the germs may remain active in water for a short time, at least. Wells in proximity to cesspools may thus become a source of danger to those who drink therefrom; and the water supply of cities, contaminated with sewerage, may cause the diffusion of the specific poison. It is a well known fact that epidemics of cholera and typhoid fever have occurred in this manner, and it is not improbable that the prevalence of diphtheria in certain localities has been due to this cause. The folly, not to say criminality, of allowing cities containing thousands of inhabitants to take their drinking water from a source polluted by the refuse of a city containing hundreds of thousands, should be fully appreciated; and let us hope a day of advanced enlightenment may come when the police power of the state can be successfully invoked to save the people from themselves. The importance of guarding the water supply from contamination should be so thoroughly appreciated by all that the question of cost will not be a deterring factor. The so-called contagious diseases—diseases communicated through the agency of living germs—can never be eradicated so long as a large percentage of the people use water contaminated with human excreta.

In concluding this division of my subject it may be stated that it is not known positively what are the conditions necessary for the infection of the individual, but it is supposed that a lesion, an abrasion of the membrane of the nose or throat, favors it. No doubt individual or family susceptibility is a predisposing cause.

Having what we may now deem to be definite knowledge that the cause of diphtheria is a living germ, we are in a position to understand the importance of preventive measures, and are enabled to intelligently resort to such agents as investigation and clinical experience have shown to antagonize its propagation and growth.

The problem of preventing diphtheria has been simplified by the discovery of its bacillary origin; for we know that if we destroy the germ we will remove the cause.

The destruction of the bacillus may be effected by the various agents known as antiseptics or bacteriocides, and by a temperature of 212 degrees or more.

It is unnecessary to enter into the details of isolating and caring for patients; of cleansing and disinfecting bedding, clothing, premises and attendants; the rules to be observed by the family in the event of the recovery or death of the patient; the precautions as to ventilation; the mode of sterilizing the discharges from the patient's throat; and the duties of undertakers. These points have been admirably set forth by Dr. Ezra M. Hunt, the able Secretary of the State Board of Health in the annual reports and in special circulars, and they are accessible to every one.

But we may, with propriety, consider some of the questions of public policy in relation to the management of diphtheria, whether it occurs as isolated cases or a general outbreak.

Probably one of the most serious questions that may present itself to the health authorities is that of domiciliary quarantine. If thoroughly enforced, combined with disinfection of the premises and the effects of the occupants, there can be no doubt of its efficacy as a measure for the suppression of epidemics. But the hardships entailed upon the occupants of the house thus isolated from the community is fully recognized, and frequently the proper authorities hesitate to inaugurate this extreme measure of repression. The legality of house quarantine does not enter into this problem as a distinct issue, as it is a settled point of law that municipalities, in common with nations and states, may resort to this measure as a safeguard to the public health. But when we consider that the family quarantined may have been infected because of some previous dereliction upon the part of the health authorities of the city or town, the question of compensation might be raised.

In instances where, due to the lack of means, individuals ill with diphtheria cannot receive the proper attention or iso-

lation at home, they should be removed to a hospital provided for this class of contagious diseases. Frequently several members of a family are infected consecutively because the premises are too small to allow of perfect isolation of the original case. It is to this class that removal of the patient to a hospital is particularly applicable; and it then becomes a measure of consideration for their own safety.

Prophylaxis involves supervision of the schools, both the week day and Sabbath schools. There can be no doubt that this disease is largely propagated through the instrumentality of these agencies, where large numbers of children gather and intimately associate during the hours of study and play. As between the sexes, the relations existing between the girls of a school are more intimate than the fellowship between the boys, and herein is an element of increased danger to the girls. The reprehensible practice of indiscriminate kissing is largely in vogue in the female department of schools, and is directly responsible for the transmission of this disease in a certain number of cases. As bearing upon this point, my own experience has been that the large preponderance of school children attacked have been girls. When we consider that, after invasion, there is undoubtedly a period of local activity, without pronounced symptoms, during which the germs are elaborating the ptomaine that will subsequently infect the entire system, we can understand what a menace a child unconsciously affected with diphtheria in this incipient stage must be to her companions in a school room. I have met with a number of instances where children affected with diphtheria have passed directly from the school to the sick bed.

Therefore, as a measure of safety to the young, in whom there exists marked susceptibility to this affection, during the prevalence of diphtheria all public schools should be closed, and what are known as the infant classes of Sunday schools should be dismissed until such time as the disease is in abeyance. If this were done, there can be no doubt but that the progress of diphtheria in any community would be largely controlled before its ravages had made so many homes desolate.

My convictions upon this subject are very decided, and I feel that too much emphasis cannot be placed upon the assertion that attendance at school during the prevalence of contagious diseases constitutes one of the most grave perils of childhood. I am well aware of the difficulties that attend the solution of the problem, for we all admit the importance of these agencies for the education of the youth of our land. But when we reflect how many valuable lives have been, and may be, lost by reason of the dissemination of infectious diseases among school children, the closing of the schools during the prevalence of such diseases in neighborhoods should be considered one of the most important measures to be instituted for their eradication.

One of the potent factors in the dissemination of disease, and one to which but too little heed has been given, is the vacating of houses after the recovery or death of a patient ill with a contagious disease and its occupancy by another family that up to this time was free from infection. As in the instance that I have noted, many houses are vacated as soon as a patient has recovered, or soon after the funeral; and, in some instances, almost immediately re-occupied by another family, who are ignorant of the danger they incur. It should be the province of health boards to prevent this. Physicians are required to give information of cases of contagious disease, and to report deaths due to such causes. For the purpose of preventing the evil above referred to, the original notice of the existence of a case of contagious disease in a house should be sufficient, and it then should be the duty of the inspector of the local board of health to caution the head of the family not to vacate the premises without first notifying the board of such intention to move, under penalty of a fine sufficient to exert a deterring influence.

After the health authorities have received such notification of intention to move, then all the effects of that family should be thoroughly disinfected before they are allowed to be taken from the premises.

After the house is vacated, it should be unlawful to rent it again until it has been properly cleansed and disinfected; and the cleansing and disinfecting should

be under the supervision of the board of health.

Boards of health should also be vested with authority to prevent families from vacating infected premises when, in their judgment, such removal would be detrimental to the health of the community.

As inspectors of boards of health are public agents charged with the grave and responsible duties of stamping out contagious diseases, it should be mandatory upon them to give personal supervision to the cleansing and disinfection of premises *immediately* after notice has been given by the attending physician that such disease prevails in a house; and not wait, as is now the custom, until the malady has spent its force in the family. Then, after the recovery or death of the patient, the premises should be *re-disinfected*. Failure upon the part of a health inspector to personally examine infected houses at least once during the progress of a case of contagious disease, should render them liable to penalties equally as severe as may now be visited upon the physician who fails to make prompt report of the existence of such patient in his practice.

To enact sanitary laws for the guidance of busy doctors, and impose penalties to insure their observance, and at the same time make other sanitary regulations and select men at a liberal salary to carry out their provisions, without the imposition of a penalty for non-observance of duty, is an unfair division of the responsibility of conserving the public health.

It should be impressed upon all who have to deal with this disease, whether in the capacity of sanitary officials or as medical advisors, that prophylaxis is the true, and, perhaps, only sure way of combating diphtheria.

If we accept as true the bacillary origin of the disease, then must we acknowledge that it is *primarily* a local affection, followed later by systemic involvement. But it is the *general* symptoms that first attract attention to the patient, and frequently while yet there are no signs of pharyngeal invasion, Now, if the general involvement is due to a poison generated at the seat of local lesion, we must assume that such poison had been formed *prior* to the onset of malaise and fever. If so, then there is but one conclusion to be arrived at—and

that is the bacilli were present in the nares, pharynx or larynx, and had already generated sufficient poisonous products to infect the system, *before* the characteristic exudate was apparent to ocular inspection. Thus, when the doctor is called upon to treat the patient, what was a local affection, has now become a systemic disturbance, with, perhaps, even at this stage, only slight evidence of localization. Hence, it is now too late to prevent general infection, although treatment may modify the progress of the malady. Unfortunately, the chances are that further advance of the disease will not be prevented, for we must admit there is no known specific for this affection, once it has seized a victim. Despite all treatment, the seemingly mild cases are liable to die of heart paralysis, and the severe cases may pursue an uninterrupted course to the grave. But this sweeping assertion must be qualified by saying that the death rate has been lessened within recent years, as the value of the recumbent posture as a life preserver is better understood, and the early use of antiseptic washes does modify, in some instances, the severity of the systemic poisoning. But, nevertheless, these agencies are not specifics.

But if we anticipate the results thus depicted, and when the disease threatens a community or family, institute *pre-invasion* treatment of the cause, by purifying the unclean places, isolating those who are sick or have been exposed to the contagion and prevent the risk of the healthy coming in contact with infected localities, we may then have the satisfaction of securing the ideal results contemplated by the votaries of sanitary science.

CAMDEN, N. J.

TREATMENT OF DIPHTHERIA.

By W. BLAIR STEWART, A. M., M.D.

[Instructor in Medicine in the Medico-Chirurgical College.]

A CAREFUL clinical study of diphtheria and scarlatina proves the facts that when one is epidemic the other usually accompanies it; that both diseases pursue uncertain, irregular and various courses; that both are often present in the same person at the same time; that every remedy will fail in certain epidemics and that almost any practical treat-

ment will succeed in another; that the prognosis of each must be very guarded, and parents must be warned at the onset of possible complications and sequelæ. In assuming the treatment of every case of diphtheria, make up your mind to give it your undivided attention and to fight it night and day until controlled. It is *absolutely imperative to isolate* every case, no difference how mild or uncertain; to strictly enforce thorough antiseptic and hygienic measures and to put the patient to bed, when it first appears, and keep him there until every trace of the disease and every complication has entirely disappeared. Do not be misled into allowing these cases to sit up or to go around, for these are the ones that often cause most trouble and prove most fatal.

Another point: If the circumstances of the family are such as to warrant it, it is best to obtain the services of a trained nurse. If this is not possible, put the case into the hands of some member of the family or one of their friends and advise them of the part they are expected to take in treating the case. It is one thing to prescribe and advise in a case of diphtheria, but it is not every case that receives the fulfillment of your directions. You may order a gargle or spray and, when they use it, it may only reach the buccal cavity, while the throat is never touched. It has been my experience that mothers and patients know very little of the proper use of a spray, and consider its superficial use to fulfill all indications; when, in reality, the medication has been thrown on the tongue, gums and hard palate only. It is not wise to trust to the "common sense" of untrained nurses and parents, but have your directions followed out in your presence, giving such advice and instructions as will insure thoroughness in every thing that is done after you are gone. Never lose sight of the fact that *diphtheria grows best when the patient is asleep*. This serves as a valuable index in treatment, which is to make your directions imperative for treatment to be followed night and day. When it is time to make local applications, to give nourishment or to administer medicine, awaken the patient. Do not go upon the principle that rest is more advantageous than medicine, for the membrane is something that

knows no rest until checked by appropriate remedies or by the resistance of vital cellular action. Fretting, worrying and rebelling on the part of children offers no excuse for neglecting treatment and making it thorough in every case. Bearing in mind these facts, and having impressed them upon yourself, the nurse and parents, you are ready to begin active treatment. Briefly stated, the treatment of diphtheria resolves itself into (1) dietary treatment; (2) internal treatment; (3) local remedies.

I. DIETARY TREATMENT

The first principles of dietary treatment are embodied in two statements, viz: (1) your patient must be fed at *regular intervals*; (2) diet must consist of easily assimilated, rich, stimulating, nitrogenous substances.

(1) *Regularity in Feeding*.—Satisfactory results are rare in those cases that are fed at irregular intervals and in those cases where six to eight hours are allowed to intervene before nourishment is given again. It is essential for nourishment to be given at regular intervals of four hours during the day and night regardless of sleep. It is best to administer all nourishment in moderate quantities and do not give it cold.

(2) *Character of Diet*.—Fresh, rich milk will form the basis of the diet and can be used alone or as a vehicle with which to combine other articles of food. From four to eight ounces of milk can be given hot at regular intervals of four hours. If this seems to disagree, to form large sour curds or to cause nausea, it is wise to add a small amount of lime water to correct acidity and to prevent the formation of such large curds. Other cases may require the addition of a small amount of pepsin to aid its digestibility. The white of an egg or the whole egg, stirred in with the milk when cold, and heated, adds to its nourishing principles. Bovine, meat extracts and juices are often combined with milk with the best results. If there is need of special stimulation, add ten to sixty drops of the best brandy to each quantity of milk given. A regular egg-nog combines nourishment as well as stimulation. In those cases where milk is refused if not desirable, whey or wine-

they can be used in its place. A good wine-whey is made by taking a cupful of milk and bringing it to a boil; stir in two to four tea-spoonfuls of the best sherry wine and as soon as thoroughly curdled, strain. Give from one to three table-spoonfuls every hour. Wine-whey may be sweetened to taste with granulated sugar. Beef juices and extracts can be added to wine-whey. Beef pulp, from which all fibre has been removed by scraping with a dull knife, will afford variety and very nourishing qualities in older children. A potato, baked until mealy, can be given occasionally. Milk jelly, chicken jelly and wine jelly are desirable. Rich meat broths can be used but beef tea is not desirable. Arrow root, tapioca, sago, rice and gelatin are not objectionable if thoroughly cooked and not given too sweet. Many valuable prepared foods are on the market. A recent case of diphtheria made a good recovery under the use of maltine with peptones. Soft boiled eggs, oyster soup, peptonized oysters, rare beef, light puddings and custards may be given occasionally. The juice of an orange is very soothing and palatable. *Avoid* veal, mutton, pork, fried and mashed potatoes, tomatoes, cabbage, turnips and the heavier articles of diet. Rectal alimentation is indicated in those cases where food can not be swallowed or retained in the stomach.

2. INTERNAL MEDICATION.

After a careful study of the various methods of treatment outlined by our various authorities, the following conglomeration of remedies is noted, which constitutes a valuable argument in favor of a rational, uniform, and scientific method of treatment. Just note the long list of internal remedies; oil of turpentine, sodium salicylate, salol, sulphur, borax, peroxide of hydrogen internally, salts of mercury, belladonna, sanguinaria, ipecac, antimony, preparations of iron, chlorate of potash, hyposulphite of soda, liq. potassæ, arsenic, glycerine, arsenite of copper, carbolic acid, mineral acids, iodine, coal-tar products, pepsin, pancreatin, trypsin, quinine, alcoholics, strychnine, strophanthus, gallic and tannic acids, ergot, etc., etc. There is no doubt but that these remedies will fulfill certain in-

dications, but the thing we are striving for is a uniform constitutional treatment. When the opinions of all, together with their clinical experiences, is summarized, the majority favor the so-called "specific treatment" with bichloride of mercury and iron.

The first indication in general treatment is to establish free action of the bowels and emunctories with salines, then follow with other measures. Following the experience of others, it has been my custom to give:

R. Hydrargyri bichloridi gr. j
Tr. ferri chloridi f. ʒv
Syr. aurantii flor f. ʒj
Aquæ q. s. ad f. ʒiv

M. Signe.—One teaspoonful, in water, every three to four hours, to a child of eight or ten years.

Push the mercury short of its toxic effects and watch it closely. The iron acts as a balance for the mercury, is beneficial for its local effects and is a good tonic. Biniodide of mercury, gr. 1-100 to 1-60, every two to four hours, is preferred by some. Chlorate of potash has long been used with iron internally, in varying doses, but is very irritating to the kidneys and depressing to the heart. Infusion of digitalis is a valuable remedy for its diuretic effects as well as being a stimulant. It is indicated where there is albuminuria, a diminished amount of urine or heart weakness, to be given in half-teaspoonful doses every two to three hours. The great objection raised to all preparations of iron and Waugh's "free chlorine mixture" is the objectionable taste and great trouble necessary to force children to take it. Every effort should be made to disguise the objectionable taste of the iron.

Diarrhœa is often present and varies in character from a true diphtheritic discharge to a mere looseness of the bowels. In all cases it is best to give one-tenth grain doses of calomel every two hours, for twelve hours, and if not checked by that time to administer sulpho-carbolate of zinc or salol in one to five grain doses every one or two hours, as necessary.

When heart failure—paralysis of the heart—is threatened, immediate stimulation is required. Give carbonate of ammonia or aromatic spirits of ammonia, in hot water, as often as necessary, always watching not to over-stimulate. Paraly-

sis is best treated with tonics of iron-arsenic and strychnine, and electricity locally. Fever varies with the condition of the throat and the malignancy of the disease. In high fever— 104° F.—use cold sponge baths rather than the depressing antipyretics. A pill containing acetanilid, gr.j; quininæ bisulphas, gr.j; and cocainæ hydrochloras, gr. i-16; may be given every hour for fever, but must be watched and not continued. Local cleanliness of the throat will do more to prevent high fever than medicines. In brief, it is necessary to avoid all depressing treatment; to use stimulants as necessary and to obtain full action from your mercurial.

3. LOCAL REMEDIES.

Here lies the success or failure of your treatment, for, if local measures are neglected for a few hours only, failure will often follow. Let your motto be *cleanliness of the mouth, nose and throat*. The day for the use of escharotics and caustics is past and, as they were used, were productive of more harm than good. If you are one of the class that believes that diphtheria is a constitutional disease with local manifestations, then it is evident to you that caustics will not check the trouble. Some authorities claim that when it is confined to a mere point, a thorough application of nitrate of silver solution will check it. This is very doubtful, for it is always a question afterward whether the case was one of a true diphtheritic type. At all events it will do no harm to try this method, if the case can be taken at the onset when the exudation is a mere point. Do not practice it after the exudation has spread. Forcibly detaching the membrane is to be condemned, as it is productive of deep ulceration, unnecessary destruction of tissue, severe hemorrhages and affords a more ready ingress to the circulation of the poison of the disease. You must make all applications gently. Discourage as much as possible the habit of swallowing the exudation, as it causes diarrhoea and intestinal inflammation of a diphtheritic type. Impress upon your older patients the necessity of free expectoration and compel the younger ones to do so if possible. Medicines can be brought into

direct contact with the throat by means of gargles, direct applications and sprays. Gargling is the most effective, in those who can do it properly, as more of the medicament is brought into direct contact with the membrane of the diseased parts. Next in efficiency is the direct application with brushes or swabs of soft absorbent cotton. The spray is least efficient as it is not often as thoroughly used as necessary and takes much more time.

Medicinal peroxide of hydrogen (strength from fifteen to thirty volumes) is the best local application known. It is a local antiseptic in destroying germs and ptomaines, it aids in disintegrating and loosening the membrane, assists in rapidly restoring the parts to their normal condition, stimulates the surrounding weakened cells and prevents spread of the membrane. It is not poisonous in its action and can be taken into the stomach without fear of toxic symptoms. It is most too strong to use in its purity, except in very severe or malignant cases, and is best used when diluted with glycerine and water. Use two ounces of hydrogen peroxide, one ounce of glycerine and sufficient water to make six ounces. Use freely as a gargle, local application or spray at *intervals of one-half hour, day and night*, until the disease is checked, then lengthen the intervals to one hour. Let me impress again that unless the gargle, local application or spray, is thoroughly done each time, good results can not be obtained. Some carry these applications a step farther by making submucous injections under and around the affected area in the throat; acting upon the principle that the germs are in the submucous tissue also—a fact. This method is questionable, is hard to follow, and, unless used with greatest care, will produce deep ulcers.

Other local remedies find favor, such as lime water solutions of salicylic acid and lactic acid, thymol, pepsin, trypsin, papoid, chlorine water, carbolic acid, tr. iodine comp., tr. ferri chloridi, persulphate and pernitrate of iron, borax, alkalies, permanganate of potash, mineral acids, turpentine, etc. Inhalations of hot steam, impregnated with turpentine, eucalyptol, menthol or thymol, are very soothing and desirable. When nasal diphtheria is

manifest, cleanse the nose thoroughly with the peroxide solution at regular intervals. After thorough cleansing, Dr. Wm. F. Waugh recommends one thorough injection with a solution of nitrate of silver, (ten grains to the ounce), not to be repeated, as very efficacious. When there is laryngeal diphtheria (true membranous croup) treat as indicated in my article on "Membranous Croup" (TIMES AND REGISTER, November 28th, 1891). Loose pieces of membrane and mucous should be removed gently. Ulcerated patches, when cleansed, should receive an application of aristol. two parts, and boric acid, one part. Inflamed glands on the neck should be thoroughly greased with ichthyol ointment (five to ten per cent.), followed by dry heat. Repeat three times daily.

In conclusion, let me urge that you do not jump from one form of treatment to another, for you will lose more than by adhering to the same treatment in that case. When the height of the disease is past and the patient is in position to recover, many physicians often become over anxious and change the treatment with fatal results. A brief summary of the present article outlines absolute rest in bed until every complication has disappeared; a course of stimulating, nutritious diet at regular intervals of four hours; internal stimulation and avoidance of depressants; bichlorides of mercury, to verge of tolerance, with tr. ferri chloridi to guard it and the local application of peroxide of hydrogen, at half-hour intervals day and night, regardless of sleep or personal objection on the part of the patient.

BRYN MAWR, PENN.

PEROXIDE OF HYDROGEN IN DIPHTHERIA.

By J. A. DEARMAND, M. D.

A GAIN is the truth of the adage, that the human family acts very like a flock of sheep when alarmed, demonstrated. The proneness of medical men to fly off the handle and follow false gods has become a by-word and a sneer with the educated laity. Every new drug or combination of drugs which is ushered into commercial existence finds a drove of medical men who are convinced on

very slight acquaintance that a cure-all has at last been found and they proceed to spread its praises with the lavish hand which enthusiasm always displays. This tendency to praise before fully investigating is to be deplored for several reasons. In the first place it puts a value on an article which is only valuable to the company who hold the right to make it. In the second place when the first burst of enthusiasm has given place to the quiet investigation by the bedside and the new applicant for popular favor is found utterly useless we lose faith in the judgment of the men who aided in booming it. We are certain to get the idea that these men have had some motive other than the good of their worshippers when they have lent their voice and pen to boom an article which we find under the most promising circumstances is worthless. If medical men would only investigate and then give the results of those trials there would not be the ground for so much back-tracking. And there can be no denial that this booming a remedy to-day and damning it to-morrow is very bad for the reputation of the profession. When the medical leaders, or the recognized leaders of any special branch of the healing art, find a remedy which the superior opportunities for observation enable them to test and they find it right and safe to advise their pupils the world over to use, then when these men suddenly turn about and denounce the very thing they lately were so enthusiastic over we, the profession at large, come to view new preparations with suspicion. We are justified in letting them severely alone until the test of time has settled the value the article possesses and then often we can find such a variety of opinion that the novice can't tell whether or not to adopt the new remedy. Every doctor in the land finds his mail filled with circulars announcing the agency or sale depot for some new remedy. Every one has the certificate of some doctor of more than local renown. The progressive physician who wishes to keep step with the profession and he orders the new candidate and he finds it is expensive but he also finds that a month's time will bring another candidate which is boomed in the same way. So it has come to be a fact that the profession can not

rely on the evidence of the leaders at the medical centres when it comes to sorting the useless and expensive preparations from the really meritorious ones. The fiend who gives samples and book marks and other little toys seems to rule the roost, and until the next man gets his toys out there is no sure thing for anybody except the maker.

Another matter that has done much to make trouble in medical ranks is the semi-proprietary medicine maker. He appears with the very plausible story that he puts the formula on the wrapper and all that he claims is the purity of drugs used and the excellence of fabrication. This gets the doctor. He thinks this new combination is just what we want. It gives the drugs we want to give but are in doubt about combining, in a fine form, and we will adopt the remedy. Furthermore in return for the bookmarks and paper knives we will say that the combination is one that theoretically should do wonders and as we have used it, it will do wonders, and soon the patient finds out that there is not much use in paying a doctor one dollar for a prescription which calls for Buncomb's bromides or Ruleum's uterine straighten-out. In this way the article which, mind you, is only prepared for the profession finds the sale the wily maker wants, and the old proprietary dodge is worked over again, and the gold brick man gets away with the boodle.

These things are matters of knowledge to the profession and yet we are forced to try every new remedy with the fear that we have been gold-bricked. Go to your druggist and ask him how many substitutes he has for iodoform. They are legion almost and each one is pronounced the very best by surgeons of national reputation. You try them and many are utterly useless. So it is of so many things that we almost wish there were some plan by which the desired knowledge of remedies could be had without paying so dearly for the knowledge.

At a recent meeting of the American Pediatric Society the eminent Prof. Jacobi read a paper in which he sat down on a remedy which has held a place as a most useful and valuable aid to our armamentarium. The doctor said in general that he had dropped the peroxide of hydrogen

as a more or less useless agent and a dangerous one as well. In the discussion of the paper which followed there seemed to be a community of sentiment, each speaker giving the remedy which has been hailed as a wonderful article a biff in a weak spot. This is very unfortunate, is the knocking another idol down. If we only could have fewer idols our sensitive natures would not be so severely shocked by the rude breaking of them so frequently. Indeed the poet might be paraphrased to

I never loved a pill or powder,
To gladden me with its fine effect,
But some big man came from under,
And gave it one in the neck.

And so it seems to be.

In order that we may view this last annihilated candidate for professional fellowship, it might not be amiss to consider what the treatment of diphtheria was before the appearance of the peroxide of hydrogen. The common plan of treatment was the use of acids locally. I am not prepared to say that this was the plan observed by the gentlemen who make and unmake drugs, but this was the treatment of the rank and file of the profession. Those were the days when it was bad to have diphtheria and worse to get the doctor. Many a child died a horrible death and on whose tombstone it could be truthfully said, "Died of a nitric acid bath." Strong acids were used recklessly. Future historians will refer to the early treatment of diphtheria as the Black Hole of Calcutta in the medical revolution. The theory was that if the membrane could be killed the child would recover. The disease was regarded as a local one all the time instead as only at the outset as we now know. Carbolic acid being a little less dangerous to use and being sufficiently destructive came into use later on. Less than ten years ago I saw a case that a good old doctor had treated by swabbing the throat, mouth, tongue and teeth with pure carbolic acid and the horrible agony that the poor little boy suffered will be a memory with me as long as I live. The grim messenger never found a soul so glad to welcome the sweet sleep which knows no waking.

When the peroxide of hydrogen came into public notice it rapidly took a place

in the safe treatment of some diseases—only one of which interests us now. It was found that, owing to the loose union which bound the extra atom of oxygen, the drug was an excellent agent for the destruction of those low forms of life, whose entrance into the blood in an active state, or after a change into a state of virulent solution, had rendered them dangerous to the health of the blood. This ought to have been enough but it was not. Enthusiastic investigators knowing something of the drug, and guessing a good deal more, found that it would do wonders in several directions. So a remedy which had done so much to set aside a treatment, which can only be mentioned under the breath, was made to do duty all along the line. Not content with using it for a purpose it accomplished with signal success and uniformly good results, it was trotted out as a cure-all; and now it is about to suffer a professional guillotining because a wrong use of it is attended by undesirable results. The main objection to the drug as voiced by the convocation of specialists, is that when used as a spray, it, having the effect of coagulating the albumen in the saliva, forms new seats for the attachment of diphtheritic membrane. Whether it does or not is a question. For myself I do not believe it does. The fact that the drug is perfectly non-irritating in the common acceptance of that word is proof conclusive that, unless the remedy is used with needless frequency, it cannot affect the healthy tissue and therefore cannot occasion new seats for infection. If there is one thing clearly recognized in the treatment of this disease, it is that the danger (croup being omitted) is from systemic poisoning, pure and simple.

The disease is a septic one, and he who thinks he has the disease cured when he dislodges the membrane has much to learn. But the student will find that the fever and prostration are lessened in proportion to the success which attends his efforts at removing the membrane, provided that be done without injury to the underlying parts. All that anybody can claim for the peroxide of hydrogen is, that when brought in contact with diphtheritic membrane, it causes it to crumble and scale off. In other words, it dissolves that part of the membrane which is in a dy-

ing or dead state. It has no effect on the deep seated membrane. Nothing has that except the acids which ignorance used to smear on so freely in the name of scientific treatment. If you can keep the membrane clear of the accumulations which are prone to gather, and whose accumulation is evidenced by the septic condition recognized in the pulse, you have done worlds for your patient. I do not think the spray is a successful mode of applying the remedy at any point. It always excites discomfort when used in the nostrils, and lime water is better and safer there. To use a solution of sufficient strength to do the work in the nostrils, you must cause pain. To spray the throat, when a few spots only are occupied by membrane, looks like hunting sparrows with a gatling gun. The plan of touching the spots with a bit of cotton wet in the solution is no more difficult than to effectively spray the surface, and it has the additional advantage of causing no dangerous trouble by way of treating surfaces which are healthy.

Buy your peroxide of hydrogen just as you do your other drugs—from a reliable house. Do not be misled into the notion that there is any hocus pocus in this drug any more than there is in any other. Then again, do not think, as is so often done, that because the article is tasteless, it can be used without any especial care. We know that for many purposes a solution of the bichloride is invaluable, and yet we do not use a fixed and unalterable strength in every case. In using the peroxide, when the membrane is thick and becoming dark, it is very necessary that it be removed, and then a good strength is called for, but when the local patches become small and thin, manifestly a reduction in strength can and should be made.

I am not wedded to any drug. Drug idolatry is a species of mossbackism which it is wise to avoid. But I do not see the wisdom of discarding a remedy which surely does all that should be expected of any remedy and this unless something better can be offered to take its place. In the discussion of this question above alluded to, not a gentleman offered a substitute, but all agreed that this one was of a dangerous nature. Let us admit that; that it is dangerous, and that the

volunteer statement that it could be applied to any surface without doing any more harm than water is untrue. Would that justify the wholesale denouncing of a remedy that stands alone in its particular field, and I may say will still hold the fort, despite the onslaught made upon it? When a remedy has been found that will do better service than any other now in use I am glad to accept it and make the change, but I do not think it wise or prudent to swap horses while crossing a stream. I have used the peroxide for many years, never as a spray except in cases where the removal of the membrane was imperative, and a few hours time meant sure death, and I have yet to see a case made worse by the proper use of the drug. In those cases where a misguided notion prompted the removal of the membrane by spraying all the mucous surfaces in sight, the throat was made sore and damage was done. But what of that? Is not that true of other remedies used without discretion and without brains? In the absence of this remedy what shall we use? Go back to the acid bath? Let all local treatment go and wait for the inevitable and the undertaker? When we have something better offered let us lay aside the peroxide, but until then let us hold fast to that which is good. This wholesale denouncing of the remedy will have at least one good effect: It will bring to their senses the men who have been proclaiming that no harm could come from a remedy which appears so mild. If care is emphasized in its use the value of this remedy will not be misunderstood nor its usefulness be overlooked. For that reason this last trouncing of the jacket will do the boy good.

DAVENPORT, IOWA.

DIPHTHERIA.

By F. W. FRANKHAUSER, M. D.

[Pathologist to Reading Hospital, Reading, Pa.]

DIPHTHERIA is a constitutional disease of an infectious character, contagious, with local manifestations in the throat, nose, mouth and mucous membranes. The most malignant of all contagious diseases, with possibly the exception of small-pox.

The character of the disease is such that the special poison is generated

and always enters the system from without. Undoubtedly of a bacteriological character, ectogenous or endogenous in their growth, if proper conditions are present, warmth, nutriment and possibly some moisture.

That it is a constitutional disease is shown by the conditions we find in many cases, where the patient is overwhelmed with the poison and dies before the local manifestations are present.

Of its contagious character we need say nothing, as all who have seen diphtheria have learned by sad experience, that the poison is of an organic character, is such that its reproduction is unlimited, its life is several days or weeks in the atmosphere or clothing, where it may find the proper place for living. What certain conditions are necessary, beyond heat, moisture and nutriment, have as yet not been found, but that much is certain, as has been shown in all epidemics.

There are many persons that escape this dreaded and fatal disease, while others in the same family, under similar conditions, are stricken down by the overwhelming onset and in a few hours, as it were, they have passed over the chasm that separates time from eternity, and the great beyond.

Diphtheria occurs in epidemic or endemic forms, generally in epidemics of more or less severity.

Contagion and some of the plans of transmission:

(a) By direct contact with the disease or patient.

(b) By the contagion coming in contact with clothing and retaining the reproductive character until a favorable soil or bed is found for the growth.

(c) By pets,¹ as kittens or chickens are known to have had diphtheria, and communicated the disease to children and members of a family—even adults.

(d) By furniture, floors, carpet, paper on the walls, by drinking vessels, or by coming in contact with anything that has become contaminated with the disease.

(e) Unsanitary conditions of school buildings, as well as private dwellings. Many buildings are exposed to the gases and foul odors arising from cesspools and sewers, to which the traps and drains

¹Zum Krank d'Housegeplugels, 1882, p. 104.

lead. Many houses do not have ventilating flues to their cesspools, or to their traps leading to their cesspools or sewers, and thus allowing the foul gases to enter the rooms, slowly but surely undermining, as it were, the health of the children, and in that way, produce what may be called a predisposition to the disease.

(f) Exposure to cold. A case was reported to the Reading Medical Association at the November meeting of a child that was suffering in our Reading schools from incontinence of urine, asked permission to leave the room, but being refused, the urine dribbled, causing her clothing to be wet, sitting near an open window, took a chill, and in a few days had diphtheria from which she died.

(g) By air. It has been shown that the conditions of the atmosphere are sometimes such as to cause the germs to be carried from place to place, and an epidemic extending over a large territory may spring forth in a few days.

(h) By public conveyances, such as carriages, cabs, street and steam cars.

Pathological conditions present :

1. There is a hyperæmic condition, then congestion, after which comes an exudation of plasma, with the changes of the epithelium that is thrown off, causing a deposit of fibrin and altered epithelial cells, containing the bacillus of Loeffler; whether the bacilli are the cause or the effects of the disease has not been fully settled. This condition extends over the pharyngeal wall, tonsils, uvula, posterior and often the anterior nasal chambers, sometimes extending into the trachea and mucous membrane of the eye. As the disease progresses the poison extends deeper, the membrane forms very soon after being detached, continuing for a week or ten days, or until the patient dies. When convalescence takes place the membrane loosens and does not replace itself again.

SYMPTOMS.—In most cases the disease has a prodromal stage, lasting for one or more days, coming on in from two to ten days after exposure to the poison. In some cases the onset is quite sudden. The patient feels indisposed, has some fever, chilly sensations; nausea and vomiting, loss of appetite, occasionally convulsions, pain in swallowing, pain in upper and lower extremities, headache,

temperature from 101° to 104° F.: on inspection, pharynx and tonsils are red, irritated, possibly small specks of a white deposit, in twenty-five hours spreading over the entire pharyngeal wall. In some cases the deposit of membrane is present almost as soon as the patient complains, and spreads over the pharyngeal wall in a few hours. In others the lymphatic glands of the neck are involved, causing swelling, and sometimes suppuration. In some cases the deposits of membrane may not be well marked at any time. In a few days the membrane becomes of a dark color, often quite black, the breath or odor coming from the membrane being very offensive; even the air of the room partakes of the offensive character. The respiration becomes labored and carried on through the mouth, owing to the nasal passages being closed with the membrane, thus occluding the air.

Saliva dribbles from the mouth, with a constant desire to swallow, pulse soft and frequent, urine scanty and high in color, later in the disease loaded with albumen, and an œdematous condition may be present. The heart's action is at first strong, but as it gradually becomes overworked by the poison in the system, it becomes weak, and sometimes degenerates and becomes very feeble, and often stops suddenly from heart failure, or paralysis. In some cases there is present paralysis of the muscles of deglutition, possibly due to involvement of the peripheral branches of nerves supplying those parts, or from myelitis from the poison in the system. This paralysis causes difficulty in taking food, or medicines, the liquid coming out of the nostrils and sometimes entering the trachea, and thus causing choking.

TREATMENT — In no disease of childhood is the physician's skill tried more, in no disease is there a more anxious look, asking for help, than in diphtheria; neither is there any disease in which there is more uncertainty as to final results, no disease so treacherous, no telling how soon you will have an attack of convulsions, heart failure or paralysis of the heart. If the patient can be seen early in the onset of the disease much may be done, but often the patient is more than half dead before you know anything

is wrong. Where the patient is taken very suddenly, and severely, the patient often dies before remedies can have any effect upon the disease.

The treatment may be divided into general and local. The general treatment is such that no definite plan can be laid down, but each case becomes a law unto itself, and the physician needs to make his own plans for each case. Early, a few large doses of quinine, large enough to produce an effect on the system rather than in tonic doses, will assist in reducing the temperature and also prevent to a certain extent the migration of the white corpuscles or leucocytes.

Where the temperature remains high, bathing, the cold bath, cold pack, or even a warm bath, will give moisture to the body, and in that way open the secretions of the skin. For the nausea, white wines, hot water, bismuth and a host of others; calomel early in one-fourth grain doses for several days. We should always remember, and in no disease does it apply more fully than in diphtheria, that, as Prof. Biddle used to say, "when in doubt, stimulate." In no disease is stimulation indicated earlier than in diphtheria, and in none better borne. Of the stimulants, wines, whisky, diluted alcohol, carbonate of ammonia, rakh among the first. Tinct. ferri chloridi also has a tonic, and possibly a destructive effect upon the disease, but it certainly is very supporting. As to the chlorate of potassium, I could never understand how it would or could act and have dropped it for several years.

R Tinct. ferri chloridi $\frac{3}{4}$ iv
Syrupi limonis q. s. ad $\frac{3}{4}$ iij

M. Sig.—One teaspoonful every hour for an adult.

I have found this very useful. As to antipyretics, we have quinia, acetanilid, phenacetine, but let us always remember not to depress the heart's action. When the heart's action becomes weak, digitalis and strychnia. To the swollen glands of the neck some use ice. I prefer hot applications, such as hot oil, or flannels wrung out of hot water and placed around the neck. Inhalations of slaking lime, or infusion of some aromatic herb, will often assist in loosening the membrane, and thus assist the labored respiration.

The room should be well ventilated, all unnecessary furniture removed, the floors bared, except possibly some carpet for the nurse to walk on. The patient should be isolated from all members of the family, except the nurse. Absolute rest in bed, as rest is important until convalescence is well advanced; as often the heart muscle becomes weakened and by the least exertion the heart's action stops by paralysis of the heart, or heart failure, and the patient drops over dead.

When cyanosis comes on and the respiration labored, oxygen by inhalation should be beneficial.

As to local treatment, as diphtheria is generally a disease of childhood, it is almost impossible to use a local remedy properly. Many remedies have been proposed and many used. But, with the addition of stearate of zinc salts, there is no reason why aristol, boracic acid, pepsin, and even calomel should not be used by an insufflator, and the powder be blown over the diseased surfaces. In older persons a gargle, consisting of hydrarg. bichloridi, $\frac{1}{8000}$, may be used to advantage.

All vessels containing sputum and other discharges should be cleansed with boiling water and bichloride of mercury. All cloths used for taking up discharges or sputum should be burned.

In the nasal passages, involved by the membrane, a solution of boracic acid gr. x to the ounce, as an injection or cleaning solution, bichloride of mercury $\frac{1}{8000}$, can be used, then the stearate of zinc powder. Peroxide of hydrogen seems too irritating for those passages.

Another important point in treating cases of diphtheria is proper feeding. Food that is easily digested or predigested should be given often and at stated intervals, day and night. Milk forms one of the important articles of food, as it can be prepared in many ways, it can be given cold, hot, in junket, egg nog, in corn-starch, ice cream, tapioca, malted milk, peptonized foods.

Beef juices, cold drinks are very grateful to most patients, ice, sucked and swallowed in small particles. In albumenuria, diuretics, with heart tonics, digitalis, strychnia. If the heart's action will bear it, a diaphoretic and hot application to the

region of the kidney, of hot water, etc. In cases of paralysis of the muscles of deglutition, strychnia and faradism rank first; general tonics.

Even after treating the little sufferers as scientifically as we know how, they will sometimes, and possibly often, look at you with such a distressed look, as much as to say "O, doctor, help me," when we are powerless to help them, and after they have gone, we can but say, "We tried to do our best."

Ruffer¹ reaches the following conclusions in regard to the processes taking place in the diphtheritic membrane:

1. The bacilli of diphtheria are present in the most superficial part of the membrane only; that is, in a place where they are well within reach of medicinal agents and observation not without interest from the point of treatment.

2. In the diphtheritic membrane there is an active struggle taking place between the amœboid cells in the membrane and the micro-organism. In other words, the diphtheritic membrane is a battlefield for amœboid cells and the pathogenic microbes of diphtheria.

3. The reason why the bacilli do not actually penetrate into the tissues is probably that, as soon as they try to do so, they are arrested by the amœboid cells present in the diphtheritic membrane.

Allow me, if you please, to mention a few cases that have come under my care, to show how treacherous this disease is:

E. S., aged three years, had an attack of diphtheria for about ten days. The membrane had all gone; heart's action good; convalescence had commenced fairly well; taking nourishment, and seemingly bright; as far as could be seen, on a fair road to recovery, when one day his grandmother raised him up in bed to give him a drink of milk, when he dropped dead in her arms.

S. G., aged seven, had a severe attack of diphtheria. In two hours after she commenced to complain, her whole pharynx and tonsils were covered with the membrane; in eight to ten days, was on a fair way towards recovery; membrane all gone; temperature, 99.3° F.; heart's action good; kidneys acting well; taking nourishment; when suddenly, as it were, the kidneys ceased to act, œdema com-

menced, and in twenty-four hours after the kidneys ceased to act, had a convulsion and died.

R. P., aged five, had a very mild attack of diphtheria, only a few spots of membrane deposited; in six days was convalescing nicely. One evening ate some ice cream; in ten hours afterwards had a convulsion; and in six hours more was a corpse. It is possible that the cream was not fresh, nevertheless the cream, or something else, caused the convulsion, and he died.

230 S. SIXTH ST., READING, PA.

Dr. Kauffman has changed the name of his weekly medical newspaper to the *Chicago Medical Bulletin*; stating that he was unaware of the existence of Dr. Shoemaker's journal. Now we feel better; since we know that ignorance of matters medical in the small portion of earth still unannexed to Chicago is characteristic of that city's doctors. Recently, a Dr. Cesna, of Chicago, inquired if there were such a journal as the *TIMES AND REGISTER*! Wake up, you Hoosiers! Here's the World's Fair right on you, and you're not awake yet. Talk about Philadelphia's sleepiness—it is tetanic hyperesthesia beside some of these Chicago people.

We desire further to remark that the man who charged Philadelphia with somnolent tendencies did not do so after coming in from a ten-mile drive over her streets in a light buggy that does not fit the tracks. The condition of our city streets is a disgrace to the country. It would hardly be tolerated in any tenth class western town. The antiquated cobble paving is bad enough, when at its best, but it is now so full of holes that a vehicle can only go over it at a walk, or risk breaking its springs. We have two fine streets paved with asphalt, Broad and Diamond; but the omnibuses have broken up this paving to such an extent that it is worse than the cobble. And then the dirt! If Philadelphia does not have an epidemic of cholera, it must be set down as an act of special Providence, exerted in favor of an undeserving subject.

Lafayette College, at Easton, Pa., has been closed ten days before the expiration of the term, on account of scarlet fever.

¹British Medical Journal.

The Times and Register.

A Weekly Journal of Medicine and Surgery.

WILLIAM F. WAUGH, A. M., M. D.,

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Published by the MEDICAL PRESS CO., Limited.

Address all communications to

1725 Arch Street, Phila.

PHILADELPHIA, MARCH 25, 1893.

DIPHTHERIA.

WHEN one has used Marchand's peroxide of hydrogen in every case of diphtheria treated, for several years in succession, without ever witnessing any bad effect from the drug, it is difficult to resist the conviction that it is a harmless as well as most efficient local application. I have applied the full-strength solution to the nasal mucous membrane of children two years of age; and with excellent results. Diphtheria being an affection of remarkably rapid progression, the applications require to be made with great frequency. Once every ten minutes while awake, and at least every half hour when asleep, are the proper intervals, when the exudation is reproduced rapidly. With young children for whom my chlorine mixture cannot be employed in full strength, nothing answers so well as the peroxide.

When the exudation has disappeared finally, and the pharyngeal tissues are left in a congested state, the depletive properties of glycerine may be united to

the germ-destroying peroxide, by the use of glycozone. This may be applied to the affected tissues by means of a brush, very frequently, as the act of swallowing is soon excited, and removes the glycozone; once every half-hour during waking is not too frequent.

Whenever the child's tissues will bear it, I continue to employ the nascent chlorine; believing that no agent is as destructive to the diphtheritic materies morbi: Indeed, in the families for whom I have prescribed this remedy during the last twenty years, the bottle is always kept filled; and I find, on making my first call for any throat affection, that they have not awaited my coming, but have commenced the use of the chlorine mixture as soon as throat symptoms manifested themselves. I doubt whether I should be obeyed, if I directed the substitution of any other remedy for a bad case of diphtheria, so strong is the faith of those who have employed this mixture in similar cases. The formula has been printed many times; but as THE TIMES AND REGISTER reaches hundreds of new readers every year, I will repeat it for the juniors' benefit:

R. Potassii chloratis pulv. ʒj

Acid. hydrochloric, U. S. P. . . ʒiiss

Misce, et adde:

Tr. ferri chloridi ʒij

Aquæ, q. s. ad. ʒiv

S.—A teaspoonful every two hours, undiluted.

It is generally necessary to explain to the pharmacist that you mean just what you say in this prescription, for he almost invariably concludes that you do not. First: The acid is *not* the dilute. I have had this prescription returned to me from Dakota, by a druggist who said I had forgotten to add the word dilute. It is the strong acid that is to be used, as the formula states. Second: The same gentleman will not mix the in-

gredients as directed, but dissolves the salt in the water, and then adds the acids, and then the gas is not liberated. If mixed as directed, the preparation will have the greenish color and the odor of chlorine, and that is just what we desire. Third: The enterprising pharmacist endeavors to correct another little inadvertence of the doctor, by slipping into the directions the advice to dilute the dose; thereby rendering it worthless. After many years of experiment, I have found that certain results are to be obtained from the mixture, if given in the strength advised; little or no results follow if the dose be diluted. In young children I apply it to the affected part with a brush or a swab.

Will my older readers bear with me if I briefly refer the newcomers to a few other points, many times told already?

The first appearance of coryza should be the signal for injecting the nostrils with a solution of silver nitrate, one per cent., or, as we used to say, five grains to the ounce. This, repeated at intervals of four hours, is almost certain to check the invasion of the nasal tract by the disease.

For epistaxis, inject with solution of chromic acid, one grain to the ounce, increased if this prove too weak. It is the only agent that has ever succeeded in stopping the hemorrhage, in my own experience.

Ice to the throat, sucked, and ice cream, are most valuable adjuvants. So are brandy, concentrated foods, fresh air, and, best of all, perfect cleanliness of house and premises, with the removal of all filth in the neighborhood. Isolation, disinfection of all articles handled, and burning of all discharges from the nose and throat, are among the first duties of the physician in charge of a case of diphtheria.

W. F. W.

NO POLITICS FOR THE NEW YORK ACADEMY OF MEDICINE: BUT JUST A LITTLE, YOU KNOW.

JUST now, as the time approaches for the meeting of the American Medical Association, and we are to have the *Code* question again dinned in our ears, and the medical politician, from his immaculate pedestal, laying down the law to us, it is interesting to watch which way the straws move on the surface, when questions involving polemics arise.

The New York Academy of Medicine has recently been the theatre of a very interesting and significant debate on the question of introducing politics into that august body. The question as we understand it was appointing a "committee in quarantine," from its membership, to co-operate with the city and state officials.

Dr Alfred L. Loomis, in a skillfully prepared and ably delivered speech, fiercely opposed admitting politics into the Academy. Dr. Derby regaled the attendance by reading a speech delivered by Dr. Lomis in 1881, in which he took a diametrically opposite position.

But, the political wing, came there to act and not to hear speeches; and the defeat of the eloquent late president of the Academy and his University backers was complete. The Post-Graduate School's president, now president of the Academy, and his new-code friends, "swept the decks," and opened the career of the new regime, by declaring that politics and medicine are not incompatible, but on the contrary both necessary and wholesome. So much for Roosa's first move. The importance of the action of the New York Academy of Medicine cannot be disguised or overlooked, for it means that the time has come when the medical profession must cast aside its former rather snobbish notion, that medical men must wall themselves off from the indus-

trial, commercial and political world and exist only in the dreamland of their own omnipotence.

Amen, we say then to Dr. Roosa, who, more than any other physician in America, has raised the standard and guarded the interests of medical men in New York state, by going to the legislature and wringing from politicians what he failed to accomplish through his fellow practitioners; a medical law, to the enormous advantage of legitimate medicine. Yes! We say, by all means let physicians wherever located take an active interest, and if necessary, an aggressive attitude, on all political questions which involve the public health, water supplies, quarantine, medical education and other public concerns which directly affect their own interests.

T. H. M.

NOTE.—The special number devoted to electrolysis is nearly ready, and will be issued on April 8. The numbers on Obstetrics and Gleet are well advanced, but not yet complete. We need for all these, *questions*, to be answered in the Bureau of Information, also, reports of unusual cases. We have also some excellent material for a special on whooping cough, and if our friends would send us enough to fill the number, it would be issued next.

Annotations.

ÆTHYL-ENDIAMIN.

ON March 10, I saw Florence P., at Lansdowne, taken ill that day. She had high fever, headache, and on each tonsil a whitish exudation. She was given an antipyretic powder every two hours, and her throat painted at the same intervals with the two per cent. cresol and æthyl-endiamin solution. In twenty-four hours every particle of the exudation had disappeared; the fever abated in another day, leaving conges-

tion of the whole pharyngeal tract. This was treated with glycozone applied every two hours, and on March 15 she was about well.

Her sister Alice was seized with the same symptoms on March 11, and ran the same course.

On March 14, Mamie C. was seized in the same symptoms and recovered in five days, under the same treatment.

The exudation was white, not ashy; the tonsils and all surrounding tissues were intensely congested, the fever high, headache very great, the pulse full, strong, and somewhat irregular at the height. In two cases, the house was in bad condition, the cellar being very wet. In the third case, kresin was substituted for the cresol. The membrane disappeared under the applications with remarkable quickness, in fact, after the third painting there was hardly a trace remaining.

W. F. W.

The moral sense of the community will heartily approve Mr. Linden's crusade against the literature displayed on the newsdealers' stands. Judging by the suggestive titles and the lascivious illustrations on the covers, these publications should be taken up carefully with a pair of tongs, and dropped into the fiery furnace. Youth is prurient and old age sensual enough, without having such stuff thrust under the eyes of everyone who goes up to a stand to buy a newspaper.

The American Association for the Study and Cure of Inebriety, will hold a special meeting at the hall of the New York Academy of Medicine, No. 19 W. 43d Street, New York City, March 23, 1893, at 8 P. M. The subject for discussion will be "Specific Remedies for the Treatment and Cure of Alcoholic and Opium Inebriety." Short papers will be read by Dr. Norman Kerr of London, Drs. Kiernan, Clevenger, and Moyer, of Chicago, Dr. Hughes of St. Louis, Dr. Peterson and Clark Bell, Esq., of New York, Drs. Mason, Mattison, Mann, and Wood, of Brooklyn, Dr. Day of Boston, Dr. Crothers of Hartford, Dr. Russell of Winchendon, Mass., Dr. Quimby of Jersey City, and others. The profession are very cordially invited to be present.

T. D. CROTHERS, M. D., Sec'y.

Bureau of Information.

Questions on all subjects relating to medicine will be received, assigned to the member of our staff best capable of advising in each case, and answered by mail.

When desired, the letters will be printed in the next issue of the Journal, and advice from our readers requested. The privileges of this Bureau are necessarily limited to our subscribers. Address all queries to

Bureau of Information,
TIMES AND REGISTER,

1725 ARCH STREET, Philadelphia, Pa.

IN reply to yours of recent date, I hereby contribute my mite to the second number on diphtheria. Having passed through one epidemic of diphtheria, in which the town was almost depopulated of children, I will write from experience and observation rather than from theory.

First of all I do not agree with Strumpell that membranous croup and diphtheria are identical, neither do I believe with Osler and Vogel that the disease may be so mild as to need no treatment.

Believing that readers of THE TIMES AND REGISTER wish for diagnosis and treatment rather than clinical history, etiology, etc., I will at once give my views on differential diagnosis from membranous croup, the only disease with which it may be confounded.

First. Diphtheria is a constitutional disease, manifesting itself mostly in the throat; membranous croup is a local disease, never manifesting itself anywhere but in the throat.

Secondly. Diphtheria involves the lymphatic glands in the neck; membranous croup does not affect these glands.

Thirdly. Diphtheria is highly contagious and occurs mostly in epidemics; membranous croup is never contagious, and always sporadic.

Fourth. Diphtheria always has high fever at onset; membranous croup has little or no fever.

Fifth. Diphtheria may attack all ages alike; membranous croup always confined to children.

Sixth. The exudate in diphtheria is in the mucous membrane of the throat; the exudate in membranous croup is on the mucous membranes.

Seventh. The exudate in diphtheria causes necrosis or sloughing of the tissues, giving rise to a characteristic odor of the breath; the exudate of membranous croup does not cause sloughing, and has no characteristic odor.

Eighth. In diphtheria we have an albuminous urine; in membranous croup we do not.

CLINICAL HISTORY—Incubation very brief, may be a few hours; onset sudden; disease may begin with chill, but always with general malaise—headache, fever, temperature, 102° to 104°, accompanied by sore throat and difficulty in swallowing; on examination of throat we find redness and swelling; if first seen a few hours after attack, we find a few round or irregular white spots on the tonsils, and are able to detect a slight but characteristic odor to the breath—once fully identified, never afterwards to be mistaken. At this point there are five symptoms which I regard pathognomonic of diphtheria:

First. The great prostration of the patient.

Second. Inability to remove the exudate from the throat.

Third. Characteristic odor of the breath.

Fourth. Enlargement of lymphatic glands at angle of jaw.

Fifth. Albuminous urine.

Finding all of these symptoms present I pronounce the case diphtheria, but if they are not present, I claim it is not diphtheria.

Here is a disease where patients die in from ten to forty hours, and the treatment to be of any avail must be heroic. This is no place for the little pill man, with his statement that "it is the mild power which cures."

Similia Similibus Curantur. Bah! Here let the true physician stand forth, knowing the deadly power of the enemy he has to meet and likewise the power he has at his own command. Formerly ninety-five per cent. of true diphtheria cases were fatal; to-day we can save the lives of one-half our patients, if called in time.

TREATMENT.—Have your patient placed in the largest and lightest room in the house, one that can be properly ventilated and heated; insist that the air in

the room shall be kept fresh and moist, and temperature never above 65° or 70° . Take an ordinary test tube, in this place half a drachm of calomel, and stop the end with a perforated cork; using a spirit lamp, hold the tube at an angle, pointed toward the patient, and close enough to him so that he will breathe the fumes; sublime the calomel. Do this under a tent, made by the nurse holding a sheet over the patient. Do this every three hours, until respirations become easy. The relief to the patient is magical. There is no danger of salivating the patient, but the nurse sometimes suffers this affliction.

For the depression of the patient, give hypodermically every two or three hours $\frac{1}{100}$ grain strychnia, combined with $\frac{1}{20}$ to $\frac{1}{10}$ morphine, the latter to blunt the nerve centres and make them insensible to the septic and ptomaine poisoning of the disease. If the patient is able to swallow, give half an ounce of brandy; or better, one ounce of champagne every one or two hours. If possible, give oxygen by inhalation two to four minutes every two to four hours, according to cyanosis of patient.

Nourish per rectum until food can be given by mouth. Tracheotomy offers but little, for the patients die from the depressing effects of the disease rather than from the mechanical obstruction of the throat, but the operation ought always to be done if circumstances indicate and parents consent.

The mortality from this disease is frightful, its invasion sudden, and its course rapid, but from my experience and observation, I believe this course of treatment will save lives where milder treatment will fail.

D. J. TILLOTSON, M. D.

CORNING, N. Y., February 16, 1893.

DIPHTHERIA, INTUBATION, RECOVERY.

CLARK F., age $7\frac{1}{2}$ years, exceedingly bright, intelligent boy, was first seen by me October 28th, complaining of severe headache, sore throat and general tired feeling. On inspection of throat both tonsils were enlarged, covered with small white spots, denoting typical follicular tonsillitis; temperature, $101\frac{1}{2}$. Octo-

ber 29th, headache relieved, throat symptoms and temperature declining. October 30th, temperature normal, is sitting up in bed, convalescent, and discharged the case. Treatment: cracked ice, $\frac{1}{40}$ gr. hydrarg. biniodide every 2 hours, and brushing the throat frequently with peroxide of hydrogen.

Nov. 2nd, was called to treat the sister, age 9 years, with the same train of symptoms, except that both tonsils were covered with decided membranous patches, and also glandular involvement indicative of diphtheria. The children were isolated, health authorities notified, who came and took charge. The same treatment was administered to the girl; the recovery was rapid. The house was fumigated on the 7th. The girl regained her normal condition during the following week, and rejoined her class in school on the 14th. The boy remained languid, and while filling out the blank for the sister to re-enter her school, a messenger called me to see the boy again. I was told that on the evening of the 13th he expectorated suddenly a large quantity of thick, slimy, tenacious matter, and had noisy breathing during the night. The tonsils were now exceedingly large; almost meeting, slight exudation on both, temperature 101 , no glandular involvement, apparently not very sick, remaining around the house among his playthings. The same treatment was again instituted, and recovery was rapid; temperature declined, tonsils becoming smaller, membranes disappeared, and dismissed the case on the 18th as convalescent.

On the evening of the 19th, I was again summoned to see him, when his mother told me he had a noisy and bad night; breathing was labored, noisy, voiceless, denoting an exudate in the larynx. On the 20th, the child took to bed, and all symptoms intensified; and at 4 P. M., my friend, Dr. Wm. M. Welch, was called in to see the case with me, and on close inspection, announced decided exudations low down on the posterior vault of the pharynx. Operative treatment was suggested and preparations made for same, should amelioration not take place soon. Tracheotomy was decided upon, but when asked, on the morning of the 21st, the family was not prepared to accept our decision and desired further time. At 3

P. M., I announced a fatal end soon; the child tossing around, extending its neck in vain to gain air; the clavicle, sternum, ribs, deeply retracted; is cyanotic; classical picture of asphyxiation; stimulants and emetics had been given, which are responding weakly. At 6 P. M., is easier; a draught of chocolate soda water caused free vomiting. At 10 P. M.; is sitting up in bed, giving directions to Kris Kingle, apparently well; breathing little noisy, but not labored. Continued in this condition until evening of 23rd, when dyspnoea again developed rapidly, did not want to be disturbed or take anything. At 11 P. M., all symptoms aggravated. Stimulants and emetics responded weakly and gave no relief. The family was now willing to have intubation done. At 5.30 A. M., the 24th, I was called; administered emetics, but there was no reaction; prays to be relieved, was choking. Fortunately my neighbor and friend, Dr. J. M. West, told me the day prior that he had a set of O'Dwyer's instruments, and was prepared to assist me at once. I called him at this last visit, and with very little trouble he introduced a tube. The child at once reacted completely, with the assistance of external warmth, etc. Feeding was somewhat difficult, liquids caused spasmodic coughing, no matter in whatever position the child was placed. Semi-solids were easily and eagerly taken; jellies, ice cream, minced raw oysters, milk toast, also nutritive enematas, milk and beef peptonoids were given.

At the end of twenty-four hours, in which period the child did elegantly, the boy plead appealingly to the kind mother for liquids, and she allowed him to drink through a small tube nearly one-half a glass of milk, when a short cough ejected the tube. The breathing was now fairly good, so we concluded, as we were near at hand, not to reintroduce it until absolutely necessary. I directed free stimulation and feeding, expecting another siege, and wishing to be as well prepared as possible. At 10½ P. M. breathing was quite difficult, and to a question of pain, he replied "I cannot get my breath." At 2 A. M. the child, of his own accord, asked the mother to send for the doctor and put the tube in his throat, as he could not get his breath. I at once called on Dr. West.

The tube was quickly placed in position without any struggles from the child. From now on the child did well, and on the 29th the tube was easily removed and rapid convalescence took place, except loss of voice. The same difficulty existed in the second intubation in reference to swallowing liquids, semi-solids and soft foods being readily taken. A larger tube was inserted the second time.

My reasons for reporting this case are:

First. Doubts as to the specific character, diphtheria. While no efforts were made to isolate the Klebs-Loeffler bacillus, the appearance and re-appearance of membranous patches, and the history are, I think, sufficient evidence of specificity. At the first intubation both tonsils were *clean*. Twenty-four hours afterwards, a decided patch appeared, due to an abrasion in intubating. After the second intubation a large membrane formed on the tip of the tongue, through the same cause, evidently, and the large exudation deep in the fauces, with bleeding surfaces.

Second. The large quantity biniodide taken and no ptyalism; about eight grains during the period from 20th to 28th, $\frac{1}{10}$ gr. hourly.

Third. That types of this character where the whole force of the disease is expended in the larynx, with little systemic trouble, low temperature, little glandular involvement, are good cases for instrumental treatment.

I feel convinced our little patient would not have survived had we not intubated, and that many are left to chance and succumb, who would otherwise survive if intubated.

DR. JOHN M. WERT.

701 N. TWELFTH ST., PHILA.

P. S.—There was continually steam kept in the room saturated with turpentine and oil eucalyptus.

AN EXPERIENCE WITH DIPHTHERIA.

IN the summer of 1892 I had an experience with diphtheria which I believe to be worth relating, as it is one which gave me a great deal of anxiety at the time, and was more happy in its issue than was to be expected.

On the 27th of August I attended Mrs.

J. in labor, and of course attended her on in confinement. At my visit on the morning of the 30th my attention was called to her little son Walter, aged 3 years 4 months. The following was his condition: Pulse 120, temperature 99.2; bowels quite loose, vomiting and quite prostrate. His vomit consisted of greenish water. He complained of his throat, his right tonsil was rather swollen, and the glands of his neck rather large. No appearance of membrane. I gave him a lot of tablets, corrosive sublimate, gr. $\frac{1}{10}$, one every two hours. I also mixed one of the Phila. Dosimetric Company's tablets of Thymoline Comp., in water four ounces, for him to have a teaspoonful every half hour until his stomach settled, then every two hours.

At 6 P. M. the same day I found him: Pulse 132, temperature 103.5, lying drowsy all the time, and an erythematous appearance about the upper part of his chest. His throat about the same in appearance. I continued the corrosive sublimate and prescribed:

R. Chloral. hydratis gr. xxiv.
Syrupi lactucarii $\frac{3}{4}$ ij.

M. Sig.—A teaspoonful in water every two hours.

My attention was now called to Edith, his sister, aged 5 years 9 months. Her condition was as follows: Pulse 132, temperature 101.5, tonsils greatly swollen and white membranous patches on each. She had been vomiting and complained of severe headache and pains in her limbs. I had isolated Walter in the morning, now I isolated her in another room, as there were both scarlatina and diphtheria in their street and I considered these a case of each. I gave her at once calomel gr. iv, and prescribed:

Potass. chlorat. 3ss
Acidi hydrochl. pur. gr. xlv
M. et adde.
Tinct. ferri chlor. 3j
Hydrarg. chlor. cor. gr. $\frac{1}{4}$
Syr. sarsaparillæ, q. s. ad. 3ij.

M. Sig.—A teaspoonful every two hours. A drink of water before but none after.

Aug. 31, '92, 7.05 A. M., Walter's temperature was 101.7, and his pulse 144. Had slept right along. His throat, tongue and palate were quite scarlet, but a distinct white patch on his right tonsil. The suspicion of eruption was less distinct

than the night before. He had no appetite and his bowels had not been moved since I first saw him. I gave him calomel gr. iv, continued the corrosive sublimate every two hours, and the chloral mixture every three hours.

Edith's pulse was 132 and temperature 100.1. Her throat looked rather freer and she had eaten a fair breakfast, but had vomited after each dose of medicine. Her bowels had moved twice. I continued the chlorine mixture but allowed water with it.

Aug. 31st, 6.40 P. M., Walter's pulse was 150, temperature 104.1, bowels not moved yet. No membrane on throat, been sleepy all day, nose occluded, urine free, neck much swollen. I gave him phenacetin, gr. ij. and left a powder of phenacetin, gr. ij. and strychnia arseniat. gr. $\frac{1}{16}$ for 9 P. M. At this time there was no appearance of eruption. I gave him calomel gr. iv, and prescribed:

R. Potass. chlorat. 3ss
Tinct. myrrhæ 3jss
Acid. carbolic gtt ij
Mel. despumat. 3ij
Aquæ dest ad. 3ij

M. Sig.—15 drops every half hour until bedtime, then half a teaspoonful every hour.

Edith's pulse was 132, temperature 104.2. Her throat had a better appearance, but she was quite delirious, and could not retain the medicine at all. Her bowels were quite loose. I gave her acetanilide, gr. iij., strychnia arseniat. gr. $\frac{1}{16}$, and left another powder of the same for 9 P. M. Ordered a triturate "Tonsillitis," Mulford & Co., every hour and gargling with pine-apple juice.

Sept. 1, 7.10 A. M., Walter's pulse 152, temperature 101.9. He was breathing more easily, and looked brighter. Slept fairly at night, ate some breakfast and bowels twice freely moved. Throat had a small patch on right tonsil. The external swelling was quite large. I mixed acetanilide gr. iv and strychnia sul. gr. $\frac{1}{16}$ in 3 powders, for one at once, the next at 1 P. M., and the last at 6 P. M. Continued the myrrh mixture, 15 drops every half hour, and a tablet of corrosive sublimate gr. $\frac{1}{10}$ every two hours, and ordered the throat atomized with:

R. Acid. carbolic gr. j
Liq. iod. comp. ℥iv
Glycerini 3j
Aquæ camph. ad. 3j

Edith's pulse 136, temperature 101.7. She had a fair night but ate very little breakfast. She did not look very bright and her respiration was quite stertorous; nostrils occluded. Membrane on throat quite thin. I ordered the nostrils freely and frequently painted with a 5 per cent. solution of menthol in ol. amygdalæ dulc., continued the tonsillitis triturations every two hours, ordered atomizing frequently with the atomizing liquid given her brother, and the administering every half hour of 15 drops of the myrrh mixture given for Walter. I mixed acetanilide gr. viij, strychn. sul. gr. $\frac{1}{10}$ in 3 powders, for one at once, the second at 1 P. M. and the last at 6 P. M.

Six P. M. Walter's pulse 144, temperature 103.9. Swelling of his neck appears to subside a little. He is somewhat brighter. Very little change in his throat, bowels moved once freely.

Edith's pulse 136, temperature 104°. She seemed utterly prostrate; vomited her 6 P. M. powder. She lay with eyes turned up, breathing with great difficulty, and very noisily. I gave her phenacetin gr. iv., calomel gr. iv., strychnia arseniate gr. $\frac{1}{14}$ and emetine $\frac{1}{7}$. Continued the drops every half hour. Ordered corrosive sublimate every hour and aconitine $\frac{1}{80}$, emetine $\frac{1}{7}$, strychn. arseniat. $\frac{1}{14}$ every 2 hours, also spt. frumenti 3 j, every 2 hours, the atomizing to be pushed, turpentine and lard to be freely applied to the neck, and turpentine 3 ss, acid carbollic 3 ss, in a quart of boiling water, to be kept steaming all the time in the room.

Ten P. M., Walter's pulse 144, temperature 102°; he lay easy and seemed to be improving; continued treatment.

Edith's pulse 136, temperature 101.5. She seemed much the same, taking all her time to breathe and dropping to sleep as soon as left alone; continued treatment.

Sept. 2nd. 7.15 A. M., Walter's pulse 140, temperature 101.3. Condition much the same; membrane not much in the throat but no less than before; bowels not moved. I gave calomel gr. iv. and continued treatment.

Edith's pulse 144, temperature 101.9. She was reported to have breathed a little easier at times through the night, but did not at my visit. Membrane not

covering the whole throat but nose full, and larynx evidently invaded. Bowels slightly moved. For the drops I substituted 3 j of syrupi sanguinaræ acet. every half hour, to be given hot. This is made by macerating 3 j rad. sanguinaræ canad. pulv. in a pint of equal parts of cider vinegar and water for 24 hours, then filtering and making into syrup with two pounds of sugar.

Five o'clock P. M., Walter's pulse 144, temperature 103.1. His throat was almost clear, but his nose was entirely occluded. He looked brighter. For the drops I substituted a teaspoonful of the acetic syrup of sanguinaria every hour, and continued the corrosive sublimate gr. $\frac{1}{100}$ every two hours and strychnine arseniate every three hours; urged the atomizing to be pushed.

Edith's pulse 144, temperature 103.7. She was breathing more easily, but still quite badly. Her nose was quite loose, and she was spitting out large pieces of membrane. Her father thought the hot sanguinaria syrup had done more good than anything else. Her eyes looked brighter. I continued all treatment, except that I substituted trinity granules for the aconitine, and added Colden's Liquid Beef Tonic.

Up to this time Mr. J., their father, had been nursing the children exclusively, as they had been unable to get anybody else, and had forbidden the obstetric nurse to go near them. On that morning, September 2nd, I found Mr. J. with his throat painful and red but not swollen nor coated at all. I ordered him to take the nascent chlorine mixture, that Edith had had to stop, in dessert-spoonful doses, also to atomize with the same mixture that they were using. Also mixed him a tablet thymoline comp. in O ss of water, for a tablespoonful every two or three hours.

Sept. 2d, 9.40 P. M., Walter's pulse 140, temperature 102.5; Condition much the same, treatment continued.

Edith's pulse 140, temperature 100.6. Her breathing was much worse. She sat up to get her breath, and went to sleep sitting up. Seemed to be weakening; I atomized her thoroughly, and got a lot of membrane and bloody muco-pus up. She was quite exhausted after it. Continued treatment, and ordered Colden's

liquid beef with each dose of medicine. Sept. 3d, 7.20 A. M., Walter's pulse 132, temperature 103. Seemed as usual. Right side of uvula covered with membrane. He had some appetite. Continued treatment.

Edith's pulse 132, temperature 101. She was counting her money when I arrived. Had more comfortable night. There was more space between her tonsils than there had been and she looked better. I got up a lot more membrane. I allowed the syrup of sanguinaria 3 ij every two hours, and continued the other treatment. Ordered ice cream, ad lib.

Mr. J.'s throat had a thin white patch on the right side, behind the tonsil. His bowels were free; atomizing continued.

R. Tinct. ferri chl. 3 iv
Potass. chlorat. 3 ij
Glycerini 3 j
Aque menth. pip. 3 ij ss
M. Sig.—A dessertspoonful every 2 hours.

Sept. 3, 2.30 P. M., Walter's pulse 144, temp. 102 $\frac{1}{4}$; not much changed; bowels not moved. Gave him gr. iv calomel. Continued treatment, adding gtt. v, tinct. ferri chl. to each dose of syr. sanguinaria, and gave him one dose of phenacetin, ij, strychnia arseniat. gr. $\frac{1}{184}$.

Edith's pulse 136, temp. 102.5. Her throat was more open still, and her nose running freely. I gave her strychnia sulph. gr. $\frac{1}{6}$, and phenacetin gr. iij. and added gtt. x to each dose of her syrup of sanguinaria. Her bowels were free.

Nine P. M. Walter's pulse 132, temp. 102. He sweat very much in the afternoon, ate a good supper and spit out lots of membrane. Treatment continued.

Edith's pulse 140, temp. 101.5. Her breathing was rather better, but otherwise there was little change. She nibbled a bit at a cinnamon bun at supper time. I got up a large quantity of membranous detritus. Treatment continued.

Sept. 4, 7.30 A. M., Walter's pulse 120, temp. 98.9. He looked quite bright, and ate anything he could get quite greedily, and from this on improved steadily, but the syrup of sanguinaria and iron and strychnia arseniat. gr. $\frac{1}{184}$ every two hours were continued well into convalescence.

Edith's pulse 120, temperature 99.6. Looked much brighter; her throat con-

tinued getting freer. Not much appetite, but a little. Continued sanguinaria and iron and strychnia arseniat. gr. $\frac{1}{184}$ every hour, and the atomizing freely.

Mr. J.'s throat not improving; bowels not free, so I gave him gr. vii calomel. Ordered gr. $\frac{3}{8}$ corrosive sublimate every hour, and prescribed:

R. Tinct. ferri chl. 3 iv
Potass. chlorat. 3 ij
Acid. hydrochl. dil. 3 j
Glycerini 3 j
Aque menth. pip. q. s. ad. 3 ij
M. Sig.—A dessertspoonful every 2 hours.

8.15 P. M., Edith's pulse 120, temperature 100.4. She was much improved and had a fair appetite. Had got out quite a cast of the upper part of the larynx apparently. I allowed of her not being disturbed at night after that, but to have medicine when she woke up.

Mr. J.'s pulse 108, temperature 101.6. Throat much the same. cervical glands quite enlarged. Ordered an onion poultice to his neck. I forgot to state that the children had had salt fat pork to their throats. I gave him two tablets acetanilide comp., and left him eight more to be taken, two every two hours. I ordered him to take syrup sanguinaria acet. 3 ij. and tinct. ferri chlor. m.x every two hours.

September 5th, 1892, 7 A. M. Edith's pulse 96, temperature 98. Still improving, though still lots of membrane showing behind her decreasing tonsils. Not much appetite. Continued treatment of the day before. Mr. J.'s pulse 72, temperature 98.7. Said his throat kept him awake all night, and membrane increasing. Continued sanguinaria and iron, and added strychnia sul. gr. 1-60 every three hours, and prescribed:

R. Ol. eucalypti 3 i
Sodii benzoat. 3 ss
Sodii bicarb. 3 j
Glycerini 3 j
Aque calcis ad 3 viij
M. Sig.—Atomize for three minutes every half hour.

Since Mr. J. was taken sick the obstetric nurse had been doing the nursing for the sick, and Mrs. J. had been trying to take care of herself, so the contagium has been more or less brought to Nellie, another child aged eight years, and, at my morning visit, attention was called to her. Her pulse was 120, temperature 101°. Her right tonsil was enlarged and

there was a large membrane patch behind it. She complained of headache and pains in body and limbs. Ordered two acetanilid. comp. tablets every two hours, and syrup sanguinaria acet. 3j every hour.

Sept. 6th, 7.50 A. M. Edith improved steadily from this on, and the treatment last stated was continued until the 9th inst., when she was well enough to do without.

Mr. J.'s pulse was 92. Temperature, 101.4. Right side of fauces and tonsil decidedly covered with membrane. Continued the atomizing, ordered calci sulphid, gr. ss every half hour, and quininæ sulph gr. ij every two hours.

Nellie's pulse, 96. Temperature, 99.4. Felt first-rate, but the membrane just the same. I continued the sanguinaria, ordered gr. ss calci sulphid. every half hour, and atomizing with the liquid prescribed for her father the day before.

Sept. 7th, 7.40 A. M. Mr. J.'s pulse, 72. Temperature, 99.5. The patches of membrane were much smaller. Bowels not moved yet, so I gave him gr. viij calomel. Continued the sanguinaria and the calcium sulphide, and ordered atomizing with hydrogen peroxide every hour. In the evening his pulse was 76 and temperature 100°. Throat not much different, though he felt rather better.

Nellie's morning pulse was 108, and temperature 99°, and she seemed all right except that there was a patch the size of a split pea on her throat behind the right tonsil. The treatment was continued. In the evening her pulse was at 132 and temperature 101°, but she did not appear any worse. I added strychnia arseniat. gr. $\frac{1}{144}$ every two hours.

Sept. 8. Morning. Mr. J.'s pulse, 72. Temperature, 98. Hardly any membrane on throat and feels much better. Continued treatment, except the atomizing with hydrogen peroxide, for which I substituted the solution of carbolated iodine in glycerine and camphor water, mentioned in the early part of this statement, which he claimed felt to him to have the best effect of any of the preparations for atomizing.

Nellie's pulse was 96 and temperature 98°, slept soundly all night, throat clean and she was apparently all right.

September 9th, 7 A. M. Mr. J.'s throat

was clear and he was otherwise doing well, so that by September 11th he was fully convalescent.

Along with the rest, the mother, who was in the tenth day of her confinement, had two small patches of membrane on her fauces from the 6th of September, but her temperature did not get above 100.4, and the membrane was all gone on the 9th of September. Her only treatment was calci sulphid, gr. ss every half hour, and syruipi sanguinaria 3j every two hours, and *gargling* with the carbolated iodine and camphor mixture. Edith's case was the worst I have ever seen to recover, and was certainly both nasal and laryngeal as well as faucial. Several of the remedies showed decided beneficial effects upon her but I think there is no doubt that the *syrup of sanguinaria, given hot*, gave her the most decided relief, though the emetine also did much towards loosening up the respiration.

My impression now is that the acetanilide was a mistake, and my experience since has led me to believe that hardly any possible degree of hyperpyrexia could induce me to give any to a diphtheritic patient. The addition to the other treatment of the strychnia very quickly showed its tonic effects, and was decidedly satisfactory. This article is different in style to most, I know, but it is a practical statement of the minutiae of every-day attendance upon a series of serious cases, such as I should have particularly liked to find when I was just starting out in practice; so I have ventured to write it, hoping that it may be of benefit to some, who need to know a little more than they have yet had an opportunity to know, of the difficulties awaiting them in their chosen calling.

S. COOKE INGRAHAM, M. D.

NO 113 SUMAC ST., WISHAHICKON, PHILA.

ECHINACEA ANGUSTIFOLIA.

THE best remedy I have ever given for diphtheria is the specific tincture of echinacea angustifolia, given in full doses. Two years ago we had many cases in our little city of 15,000 souls, and many deaths. I treated thirteen cases and lost but one. Echinacea was my sheet anchor. Try it, and you will be pleased with the results.

A. L. FOREMAN, M. D.

STOCKTON, CAL.

THE SECTION ON THERAPEUTICS OF THE PAN-AMERICAN MEDICAL CONGRESS.

WILL you kindly state in the columns of your esteemed journal, that it is the earnest desire of the officers of the the section on Therapeutics of the Pan American Medical Congress, that both specialists and general practitioners should contribute articles to its proceedings.

Gentlemen who desire to read papers at this meeting should notify the undersigned at once of their intention, and should send him, by July 10th at the latest, an abstract of their paper in order that it may be translated into the three official languages of the Congress and published in the programme. The importance of this section, and the interesting papers which have already been promised, give assurance of a very successful meeting.

H. A. HARE,
President of Section.

The Medical Digest.

TREATMENT OF DIPHTHERIA.

WHILE laying stress upon the fact that hydrogen peroxide is not a specific, I do claim that it accomplished the most good, and at the same time has absolutely no objectionable qualities, which latter remark is applicable to very few germicides. I most heartily endorse the statements as to its advantages as made by Dr. Bloodworth, of Philadelphia, namely, that it checks the growth and increase of the bacilli, and is "non-irritant, colorless, odorless, tasteless, and causes no pain." I also believe with Dr. Greig, of Toronto, that it prevents the production and absorption of the poison, "and it has the property of oxidizing many organic compounds;" also that it undoubtedly acts as a solvent upon the membrane.

The plan that I have found most satisfactory for the application of these agents is: First, spray the throat with the hydrogen peroxide; this is to be followed in one hour by the application of a 5 per cent. solution of oleate of mercury—the application being made with a camel's

hair pencil. This plan is continued throughout the entire course of the disease—the hydrogen peroxide being alternated every hour with the oleate of mercury.

While oleate of mercury possesses many of the properties for which we should use the bichloride, it is not irritant like the latter, and is practically harmless when used in the strength above mentioned.

As to the internal administration of remedies, the practitioner must be guided by circumstances and his own good judgment. With the exception of stimulants, there are no medicines that I would particularly recommend for internal administration. While iron, so extensively used at present, may be of benefit, I fail to see the indications for its use, and have but little faith in its reputed worth.

The careful support of the patient's strength by the judicious administration of liquid food is as indispensable to the successful results as is any part of the treatment. Our most valuable ally in this line is milk. If the child rejects food and offers forcible resistance to its administration, then it must be nourished per rectum.

When the pseudo-membrane has extended to the nares, we have to cope with the disease under more difficult conditions. In this situation, owing to the greater extent of mucous surface exposed, there is a more extensive field for the absorption of the poison. Under these conditions it is very necessary to keep the passages clean and thus prevent, as far as possible, the absorption of the poison. For this purpose, Loomis recommends the nasal douche, with a fountain syringe, using a one per cent. solution of carbolic acid.—*Hazen, Va. Med. Monthly.*

Scheiller says men are not men until they reach the age of twenty-eight years. A remedy is needed that will hold in check the functions of manhood until that age has been reached. Thus far our resources are abstinence from alcohol and albuminous food, vigorous work for the body and mind, and cleanliness in body and mind; clean reading, clean conversation and clean thought.